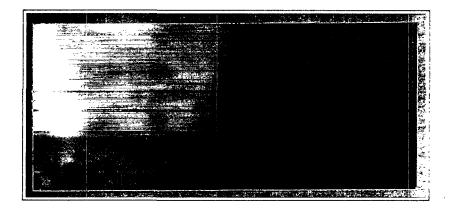
Gult

Bally Report



Environmental Resources Management



999 West Chester Pike • West Chester, Pennsylvania 19382 28 (215) 696-9110 11 February 1986

Mr. Stephen M. Wilner
Corporate Manager
Industrial and Environmental Health
Allegheny International, Inc.
Two Oliver Plaza, P. O. Box 456
Pittsburgh, Pennsylvania 15236

Dear Mr. Wilner:

Environmental Resources Management, Inc. (ERM) is pleased to present this letter report summarizing the findings of our Phase I investigation relative to ground water contamination by organic solvents in the vicinity of the Bally Engineered Structures plant located in Bally, Pennsylvania.

Introduction and Background

Water quality analyses from the two municipal production wells (Well No. 1 and Well No. 3, Figure 1) that supply the Borough of Bally, Pennsylvania revealed that Well No. 3 contained low concentrations of 1,1,1-trichloroethane and trichloroethylene (1982 analyses). Subsequent investigations by the Pennsylvania Department of Environmental Resources (DER) have suggested that the Bally Engineered Structures facility, located at the southern edge of the borough, may be the source of those compounds (letter of 25 August 1983). Allegheny International Corporation, the parent company of Bally, retained Environmental Resources Management, Inc. (ERM) in September 1985 to provide professional hydrogeological services relative to this situation.

ERM has proposed a three-phase program to meet Bally's objectives of: (1) defining their legal liability and (2) defining an appropriate remedial program, if necessary. The scope of each phase was defined as follows:

- Phase I: Obtain and evaluate all pertinent existing data
- Phase II: Conduct a comprehensive hydrogeologic investigation to determine the conditions associated with the Bally facility
- Phase III: Develop a remedial program, if necessary



Mr. Stephen M. Wilner Allegheny International, Inc. 11 February 1986 page 2

On 25 October 1985, Bally issued P.O. No. P36894-00 for the Phase I investigation. This letter report presents ERM's findings in regard to the Phase I-Fvaluation of Existing Data and recommendations for the Phase II-Comprehensive Hydrological Investigations.

Operational History

Bally Engineered Structures produces prefabricated climate-controlled buildings utilizing a form injection process that was developed in 1962. In the manufacturing process, chlorinated solvents are used as degreasing agents, as quenching agents for the foam injection process, and to clean the foam injection heads. The solvents are currently stored in various areas inside and outside the plant area. These areas are indicated in Figure 2. Discussions with Stanley Miller, Plant Manager, revealed the existence of past solvent storage and handling areas, which are also indicated in Figure 2.

In addition, two sets of USGS aerial photographs from 1955 and 1969 were obtained of the site. Based on the analysis of the 1955 photographs, ERM substantiated that the former wastewater lagoon at the site, which the Pennsylvania DER has thought to be a possible chlorinated solvent source (letter of 25 August 1983) is located under the current warehouse at the plant (see Figure 2). Discussions with Mr. Miller indicated that the warehouse was built over the lagoon in 1966. Photographs taken in 1969 show the warehouse over the former lagoon area. The 1969 photographs also show a "dirt area" in the field to the northwest of the plant where Municipal Well No. 3 is now located (see Figure 2) and a road from the fill along the west side of the Bally facility. Well No. 3 was installed in 1977.

Site Geology/Hydrogeology

Three bedrock geologic units are indicated on the Geologic Map of Pennsylvania in the area immediately around the Bally plant site. These units are:

1. Unnamed and undifferentiated granitic and hornblende gneisses of Precambrian Age, and the Cambrian Age Hardyston Quartzite.

Mr. Stephen M. Wilner Allegheny International, Inc. 11 February 1986 page 3

- 2. The Triassic Age Brunswick Formation consisting of red shales, siltstones, and quartzose sandstones, which have been mapped as striking northeast to southwest, with a dip direction to the southeast.
- 3. Triassic Age fanglomerates consisting of interbedded limestone conglomerate and breccia which overlie the Brunswick Formation.

The locations of the contacts between these units are in question and may have an influence on the direction and volume of ground water flow around the plant site. Figure 3 shows the various interpretations of the contacts. The Geologic Map of Pennsylvania (1980) and the Soil Map of Berks County (1970) have placed the contact of the Precambrian/Cambrian Age units and the Triassic Age units at the northeast corner of the plant. Based on interpretation of the well log for the Bally Municipal Well No. 3, the land surface topography of the area, and analysis of aerial photographs by ERM, the contact of these rock units may occur approximately 1,500 feet northwest of the mapped contact (see Figure 3). The proposed drilling at the site will provide additional subsurface data regarding the position of the contact at the plant site.

Due to the well consolidated nature of all three of these geologic units at the Bally site, no ground water flows through primary pore space of the rocks. All ground water movement through these geologic units is dependent on the orientation and distribution of secondary features such as fractures, joints, and bedding planes that formed within the strata after they were lithified. These secondary features control the volume and direction of ground water flow through the subsurface at the site.

In order to more precisely determine the orientation and distribution of these secondary features and thus more precisely define the ground water flow directions, a fracture trace analysis was performed using air photographs and topographic maps to plot any linear trends that may be indicative of fracturing. The fracture traces are plotted in Figure 4. In general, the traces indicate a major northwest-southeast fracture trend is present near the Bally plant along with a secondary northeast-southwest trend. Specifically, the following relationships were observed from analysis of the photographs, topographic map, geologic, and soil maps:

Mr. Stephen M. Wilner Allegheny International, Inc. 11 February 1986 page 4

- 1. The Bally plant and Municipal Well No. 3 lie on a northwest-southeast trend which is the same orientation as the major northwest-southeast fracture trend.
- 2. Municipal Wells No. 1 and No. 3 lie on the minor northeast-southwest fracture trend.
- 3. The Bally plant and Well No. 1 also lie along the presumed strike direction of the Brunswick Shale if the contact is actually further to the northwest than indicated on the Geologic Map of Pennsylvania.

Based on topography, ground water flow at the site is presumed to be to the southeast. However, high-volume pumpage by either of the two municipal wells along one of the three linear trends discussed above could alter ground water flow away from the preferred southeast direction and toward the respective pumping well.

Monthly Water Ouality Data

Monthly water quality data for Municipal Wells No. 1 and 3 were obtained for the period from November 1982 to September 1985 from Gene Smith, Manager of the Borough of Bally. These data were examined by an ERM hydrogeologist and are tabulated in Table 1. In addition, monthly total precipitation data for the nearest rain gauging station (Bechtlesville, Pennsylvania) were obtained and are also presented in Table 1.

Time trend plots for Municipal Wells No. 1 and 3 were constructed for the two most prevalent organic compounds, 1,1,1-trichloro-ethane and trichloroethylene. These plots were evaluated for indications of increasing or decreasing concentrations or for fluctuations that could possibly be correlated to seasonal precipitation trends or major recharge events. These plots are presented in Figures 5 through 8. The results of the analysis indicate:

Figure 5 - Municipal Well No. 1: Trichloroethylene

- Low concentrations are present (2 to 8 ug/l).



Mr. Stephen M. Wilner Allegheny International, Inc. 11 February 1986 page 5

- No correlation with rainfall/major recharge events is apparent.
- No long-term increase or decrease in concentation is apparent.

Figure 6 - Municipal Well No. 1: 1,1,1-Trichloroethane

- There is a long-term increase in the concentration of 1,1,1-TCE over the three-year period of sampling, from an initial non-detectable level to 64.2 ug/l in September 1985.
- This increase is not correlated to any rainfall/ major recharge event, thus it appears to be due to continued pumpage of Bally municipal Well No. 1.

Figure 7 - Municipal Well No. 3: Trichloroethylene

- The levels ranged from 200 to 1.127 ug/l over the three-year period of sampling.
- No definitive trends can be established from the plot. Variations may be related to sampling and laboratory analytical techniques.

Figure 8 - Municipal Well No. 3: 1,1,1-Trichloroethane

- The levels varied from 1,400 to 4,471 ug/l over the three-year sampling period.
- No definitive trends can be established based on the analytical data. Variations may be related to sampling and laboratory analytical techniques.

Pennsylvania DFR 1983 Well Sampling

Analytical reports from the files of the Pennsylvania DER Norristown office were collected. These reports included the results of water samples collected in January 1983 from the two municipal wells and from selected residential and commercial wells in the vicinity of the Bally Engineered Structures facility. The results of these analyses were used to construct

Mr. Stephen M. Wilner Allegheny International, Inc. 11 February 1986 page 6

isoconcentration maps (Figures 9 and 10) for the two compounds detected, trichyloroethylene and 1,1,1-trichloroethane. The results indicate that:

Figure 9 - Trichloroethylene

- The highest concentrations were found in Bally plant well (1,000 ppb).
- Concentrations were lower in Well No. 3 and the Gehman well.
- The plume (defined by isoconcentration line) appears to be migrating to the northeast towards Bally Municipal Well No. 1 due to pumpage.

Figure 10 - 1,1,1-Trichloroethane

- The highest concentrations were found in Municipal Well No. 3 (2,500 ppb), while the Bally plant well was much lower (190 ppb). This condition suggests that the municipal well is closer to the source area than the Bally plant well. Thus, the dirt area on the 1969 air photographs may have been a disposal area.
- The plume defined by the isoconcentration line appears to have migrated to the northwest towards Bally Municipal Well No. 1 due to pumpage.

Conclusions

Based on the results of its Phase I investigation, ERM makes the following conclusions:

1. Aerial photographs of the Bally site show the former wastewater lagoon was located in the area now occupied by the current warehouse area. Aerial photographs for the year 1969 also show that a disposal area may have existed adjacent to Well No. 3.

Mr. Stephen M. Wilner
Allegheny International, Inc.
11 February 1986
page 7

- 2. Fracture trace analysis has shown a number of fractures in the plant area, with predominant northwest-southeast and northeast-southwest trends. The fractures may act as pathways for migration of organic compounds through the ground water flow system.
- 3. Time trend plots constructed for Bally Municipal Wells No. 1 and 3, using monthly analytical results for the period 1982 through 1985, show no consistent trends related to precipitation/major recharge events.
- 4. TCE data for Well No. 1 show a long-term increase, suggesting that TCE is being drawn toward this well due to pumpage.
- 5. Isoconcentration plots constructed using water quality data from a Pennsylvania DER well survey taken in January of 1983 for the compounds TCE and 1,1,1-TCE suggest that the Bally Engineered Structures plant may be the source of the TCE found in Well No. 3, while a possible former disposal area identified next to Well No. 3 may be the source of the 1,1,1-TCE found in that well.
- 6. Pumping of Municipal Well No. 1 has apparently stressed the aguifer, causing the plume to move to the northeast rather than along the postulated natural ground water flow direction to the southeast.

Recommendations

A Phase II hydrogeologic investigation program is recommended. It should be noted that the proposed Phase II program is considered to be a minimum program to define the direction of ground water flow and the possible sources of the contamination. After data from this program are obtained and analyzed, it may be necessary to perform additional investigations to resolve any remaining uncertainties. ERM's recommendations are as follows:

1. Meet with representatives of the Pennsylvania DER and the Borough of Bally to discuss the results of the Phase I investigation and the proposal for Phase II.



Mr. Stephen M. Wilner Allegheny International, Inc. 11 February 1986 page 8

- Conduct a geologic reconnaissance of the area to further define the geologic contacts and locate outcrops for strike and dip measurements of the bedding planes, joints, or fractures.
- 3. Resample selected well locations from the Pennsylvania DER's original list of 25 wells to determine the current ground water quality conditions. The sampling should be completed within a two- to three-day time frame using a single reputable laboratory for analysis. These data should be plotted to define the areal extent of the plume.
- 4. Seven monitoring should be installed to further define the hydrogeology (i.e., flow direction) and ground water quality at the Bally plant site. The well locations are shown in Figure 11, and the reasons for their placement, and the depth and the purpose of each well is as follows:

Well A - Upgradient Shallow Well
Depth: 50 feet
Purpose: - Background water quality

 Define ground water elevation to interpret ground water direction/ hydrogeology

Well B - Downgradient Shallow Well

Depth: 50 feet

Purpose: - Check for any southerly plume migra-

 Define ground water elevation to interpret ground water flow direction/hydrogeology

Well C - Downgradient Shallow Well

Depth: 50 feet

Purpose: - Monitor water quality between plant and Gehman well

- Define ground water elevation to interpret flow direction/hydrogeology
- Potential purge well

Mr. Stephen M. Wilner Allegheny International, Inc. 11 February 1986 page 9

> Well D - Downgradient Well Nest Depths: 50 and 150 feet

> > Purpose: - Monitor water quality between plant and Well' No. 3

- Monitor potential downward movement of organics
- Define ground water elevation to interpret flow direction/hydrogeology
- Potential purge well

- Monitor potential downward movement of organics
- Define ground water elevation to interpret flow direction/hydrogeology
- 5. A "dirt area" next to Well No. 3 was observed on the 1969 aerial photographs. A soil boring should be located in this area, with continuous soil samples taken between zero and ten feet and at five-foot intervals from ten feet to the top of competent bedrock. Selected samples should be analyzed for a full volatile organic scan to determine if this was a former waste disposal area.
- 6. Each of the seven newly installed wells and the existing Bally site well should be sampled and analyzed for a full volatile organics scan to establish the type and concentrations of volatile organics, if any, are present. These analyses, in combination with the analysis of ground water levels, will allow for interpretations based on data collected within the same time frame and using the same sampling and laboratory testing techniques.
- 7. Two pump tests should be conducted to determine the hydrogeologic properties of the water-bearing unit(s) in the site area. Both drawdown and recovery measurements will be made.

Mr. Stephen M. Wilner Allegheny International, Inc. 11 February 1986 page 10

- a. An eight-hour pump test on Well No. 3 to determine the influence of this well on any of the newly installed monitoring wells and on selected existing wells. The results of this test should be used in the determination of the extent to which this well could have drawn organics toward it from one or more sources.
- b. A 24-hour pump test should be conducted in one of the newly installed monitoring wells, to be selected according to field conditions and ground water quality encountered.
- 8. A technical report should be prepared presenting the results of the Phase II investigative program. Data should be both tabulated, and presented in plan view and cross-sectional view to provide a three-dimensional definition of the extent of ground water contamination. Conclusions and recommendations should be stated relative to the magnitude of the problem, the most likely source(s) and direction(s) of migration of the contamination, and the need for any possible further investigation. If required, a waste treatment engineer should review the data to define those steps which would then be necessary to define cost-effective alternatives for remediation.
- 9. Meetings should be held with Pally, the Borough, and Pennsylvania DER representatives to discuss the results of the Phase II investigation.

If you have any questions on the Phase I report regarding the data presented, our interpretations, or our recommendations for Phase II, please feel free to call. We thank you for the opportunity to provide these consulting services to you.

Very truly yours,

George E. Heim, Ph.D.

Project Manager

Francis D. Smith Project Geologist

GCH/vgu attach.

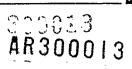
cc: T. W. Pietrocini-Bally Engineered Structures

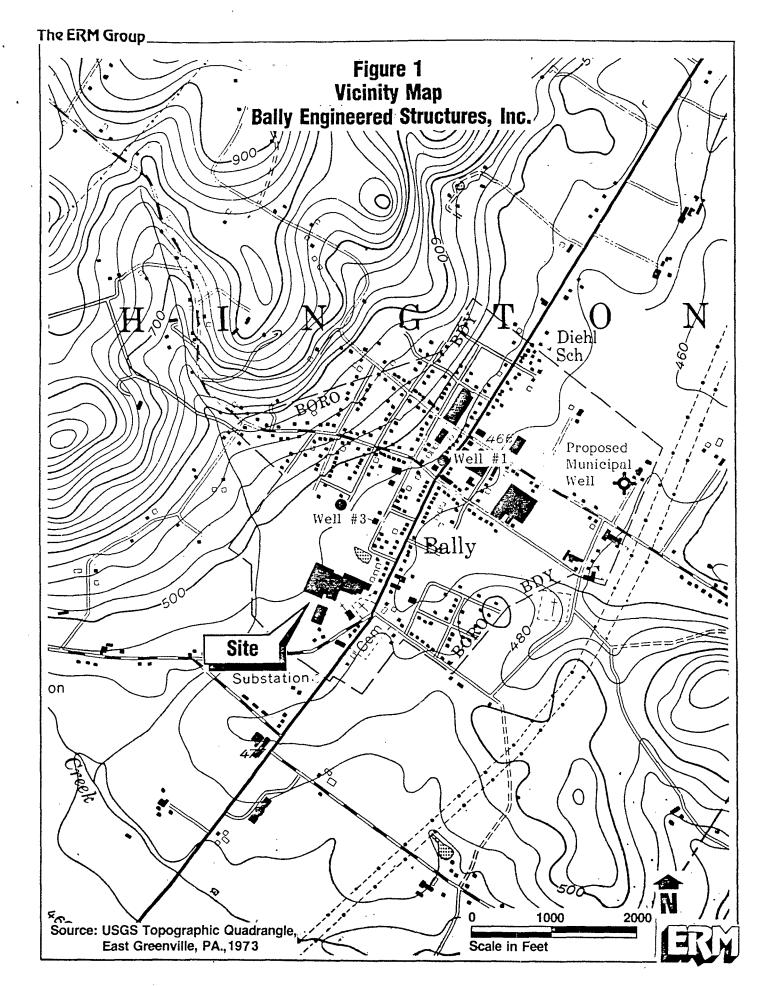
REFERENCES CITED

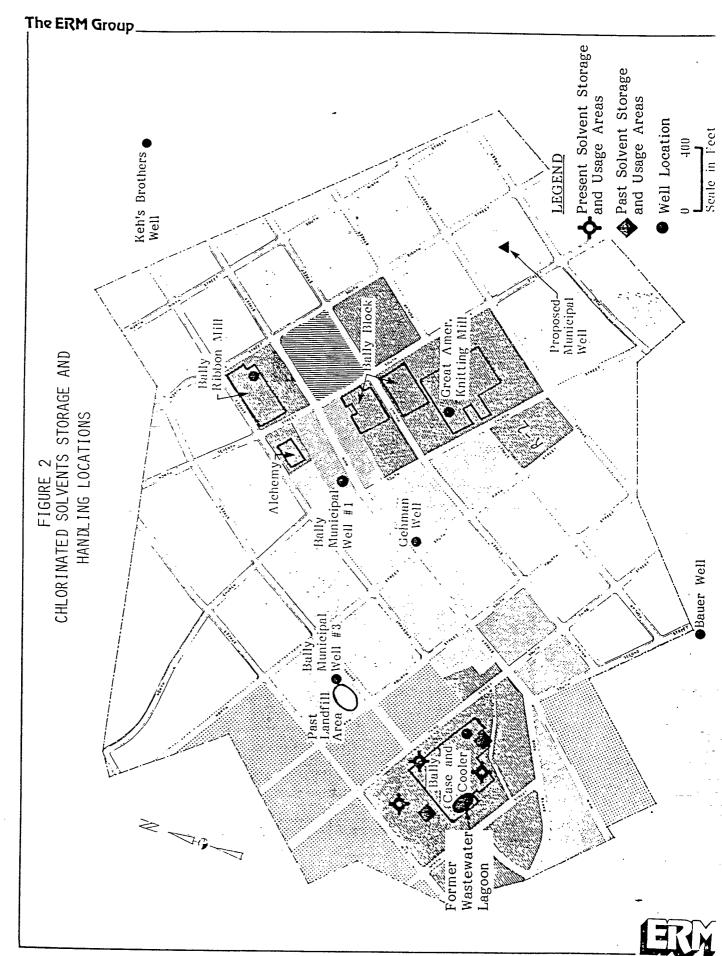
- 1. Letter from W. E. Stanley, DER, to T. W. Pietrocini, Bally; August 25, 1983.
- 2. Geologic Map of Pennsylvania, 1980.
- 3. Ackerman, F. S., 1970; Soil Survey of Berks County, Pennsylvania; USDA Soil Conservation Service; 125 pp.

The	ERM	Group_

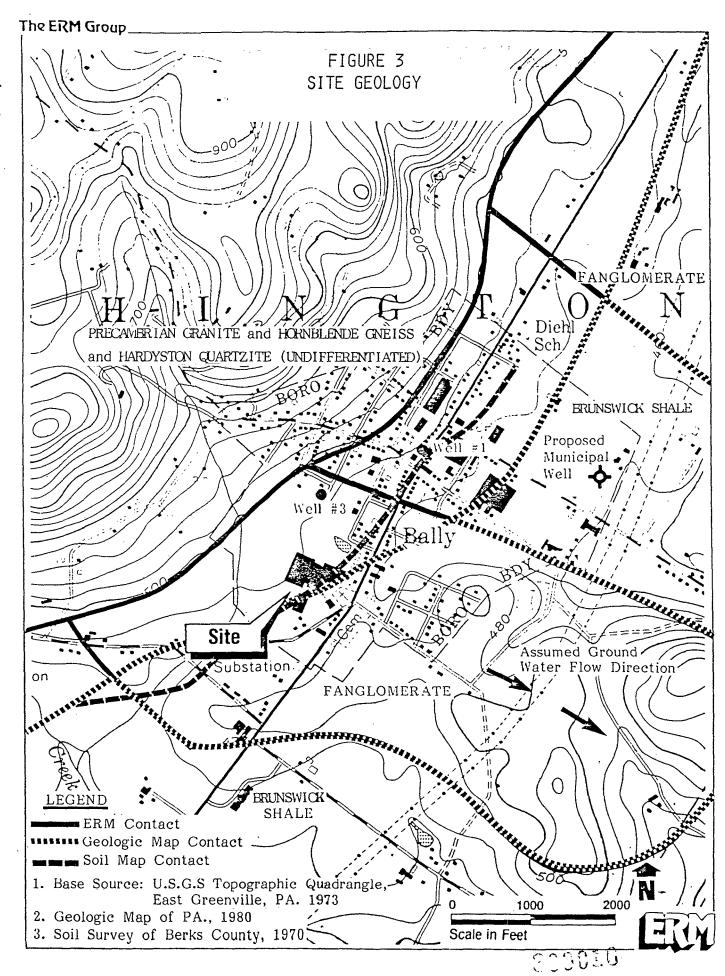
	Tetrachlondthylene Well #1 Well #5	4,40 1,70 .40 .30 2.60	4,40 38.30
	Mell #1 Well #3	5.50	30.70
Structures Bally Il Data sults ug/l)	1,1-Dichlorvethylene Well #1 Well #3		141.00 126.10 126.10 132.00 1.52.00 1.60.294.00 1.60.294.00 2.30.296.50 2.30.296.50 3.30.296.10 3.30.457.60 3.64.30 3.64.30 3.64.30 1.70.40 1.70.40 1.70.40
Table 1 Bally Engineered Structures Borough of Bally Municipal Well Data (All Chemical Results ug/l) Blank - Compound Not Analyzed	Trichlorcethylene Well #1 Well #3 717 73 5.40 417.00 3.40 3.40 3.40 3.55 3.10 3.50	2. 16 2. 26 2. 28 3. 20 619.40 3. 20 629.00 3. 20 547.00 1. 47 7547.00 6. 00 865.00 6. 00 1597.00 4.00 1597.00 4.00 1597.00	4.31.00 4.31.00 6.16.30 6.16.30 6.16.30 6.16.30 4.20 646.00 4.20 646.00 4.20 629.10 4.20 629.10 6.45 621.00 6.77 665.10 6.45 681.00 7.48 715.10
	1,1,1-Trichlorcethane Well #1 Well #3 2531.00 2.20 2.20 3.30 2.30 2.30 2.40 2.40	2.35 2.37 2.34 3.55 3.33 3.33 6.39 4.00 4.00 2.31 0.00 2.31 0.00 2.31 0.00 2.31 0.00 0.31 0.00 0.31 0.00 0.31 0.00 0.31 0.31	5.40 2429.00 2108.00 2075.00 3035.00 15.80 2888.90 19.50 2778.80 20.90 3417.50 22.00 2225.30 33.70 3904.60 46.60 4471.60 37.17 2102.20 37.17 2102.20 37.17 2102.20 37.17 2102.20 40.00 2948.80 40.00 2948.80 40.00 2948.80
	Monthly Date ppt (in) 11/11/62 11/12/63 11/18/63	4,712/83 4,712/83 5,10,83 6,14,83 6,14,83 6,12,83 7,26,83 1,10,22,83 1,22,83 1,22,83 1,22,83 1,22,83 1,22,83 1,22,83 1,22,83 1,23,83 1,24,84 1	3,52,784 5,22,84 5,22,84 6,26,84 7,24,84 8,35 7,24,84 8,37 9,24,84 2,87 10,24,84 2,87 10,24,84 3,87 1,22,83 1,44 2,26,83 3,26,83 1,44 1,44 1,44 1,44 1,44 1,44 1,46 1,23,85 1,86 4,23,85 1,86 4,23,85 1,86 4,23,85 1,86 1,86 1,23,85 1,86 1,23,85 1,86 1,23,85 1,86

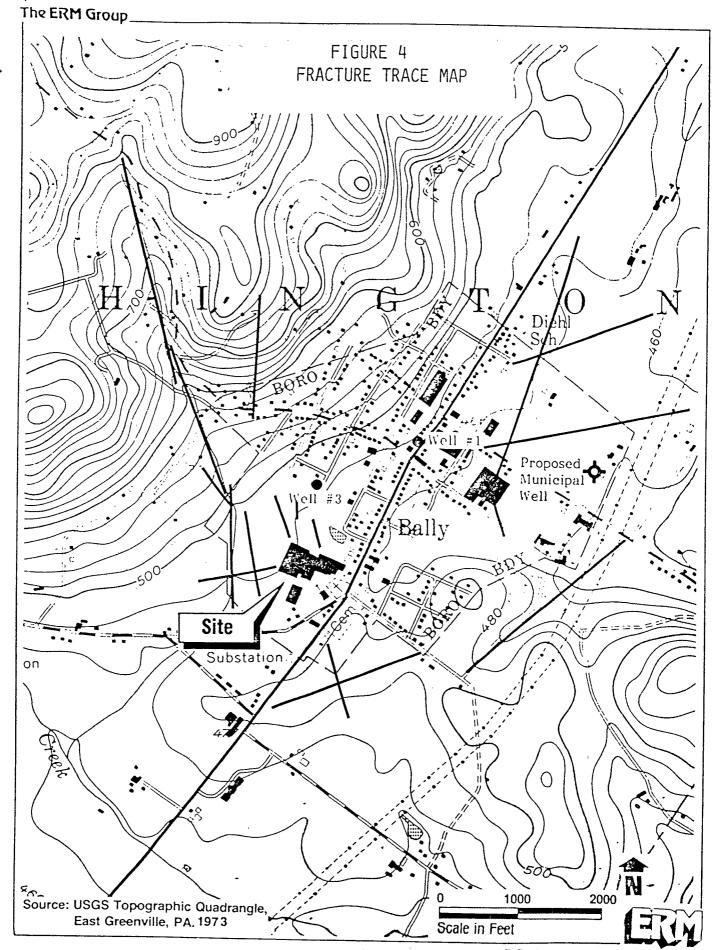


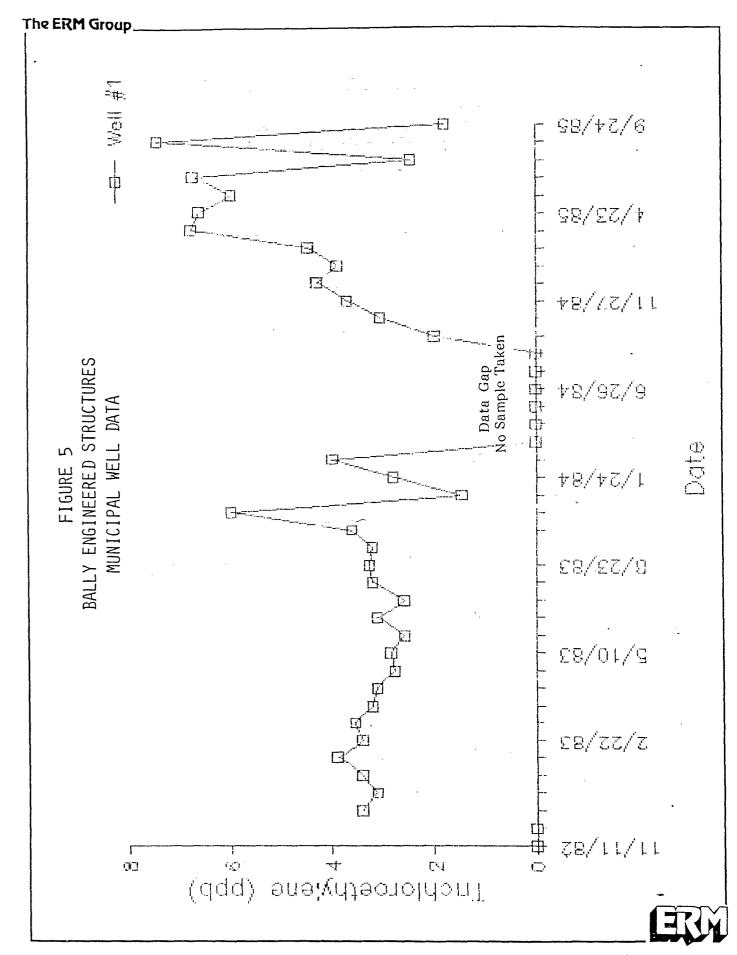




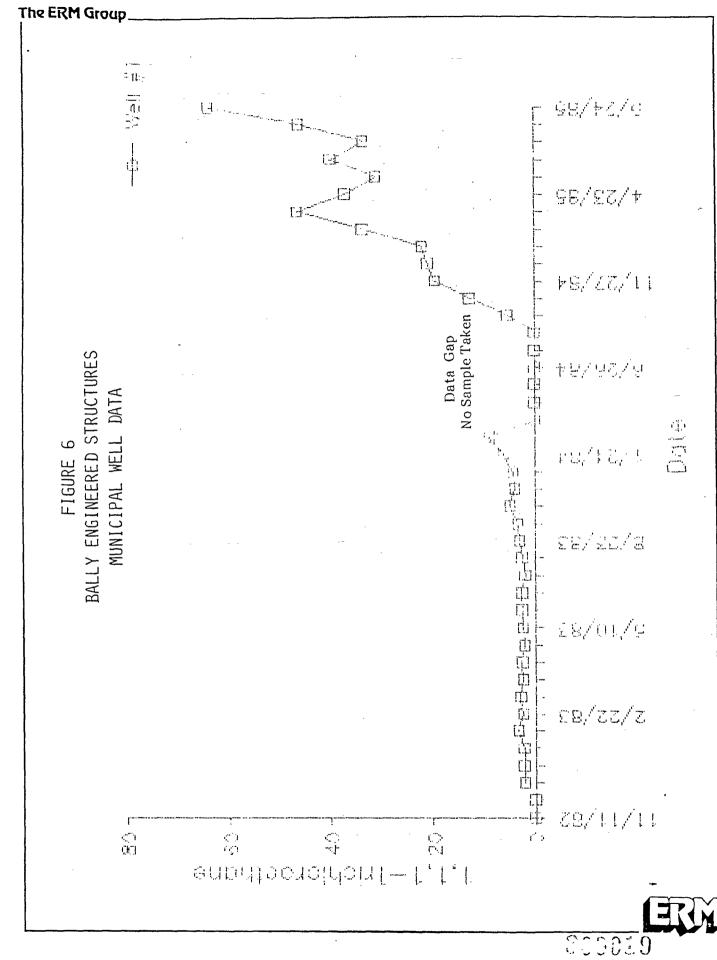
\$20015 AR300015



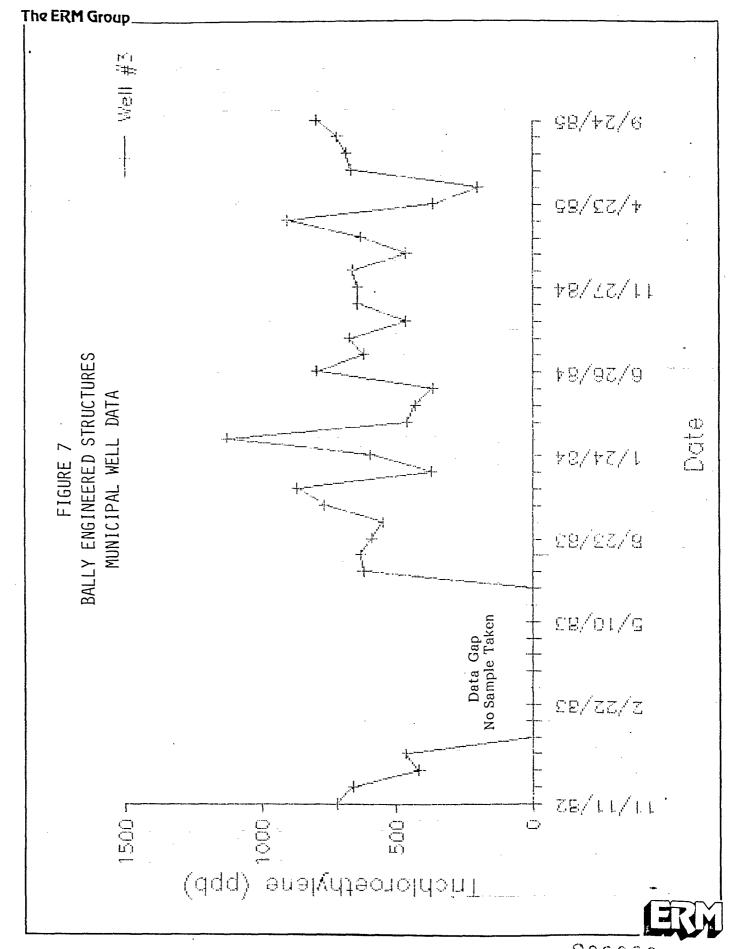




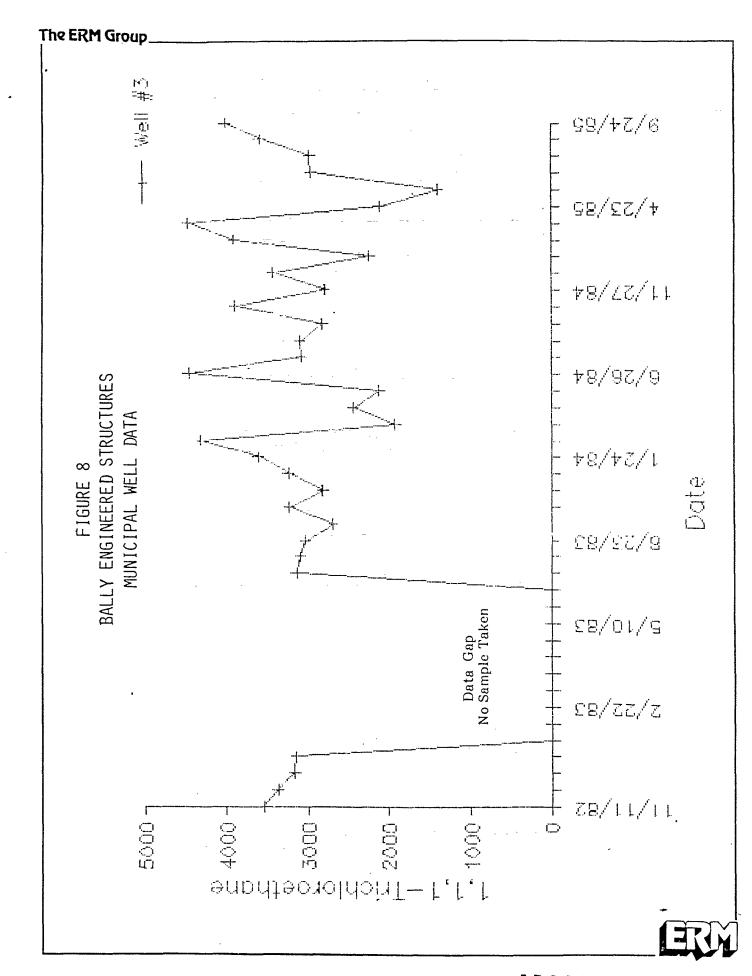
AR300018

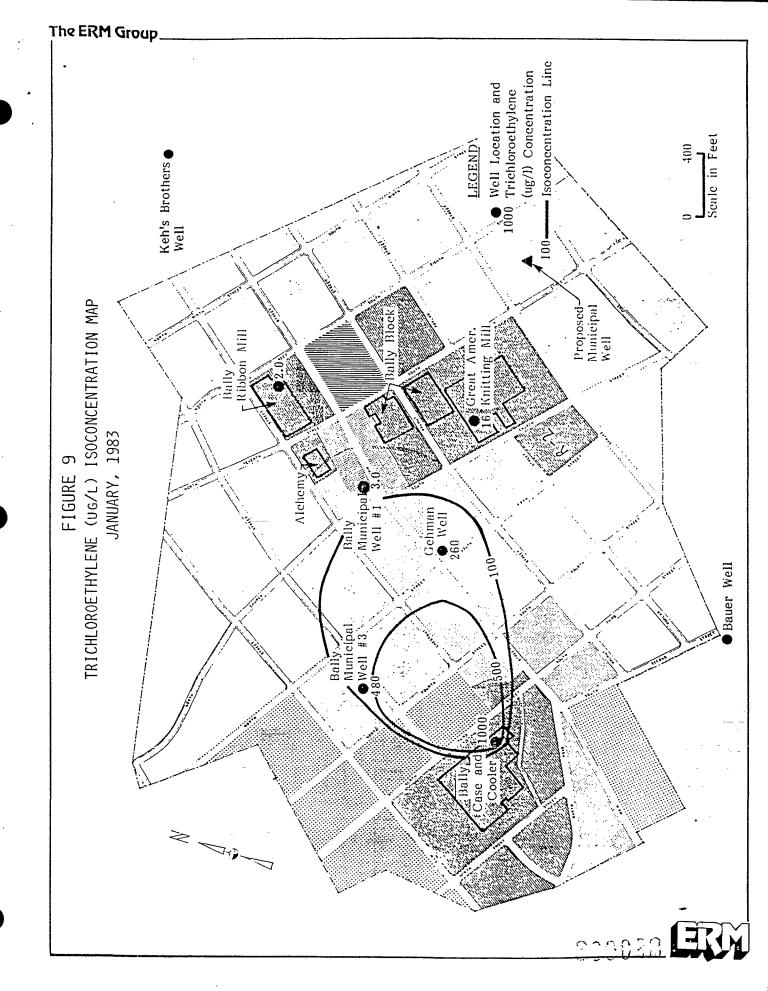


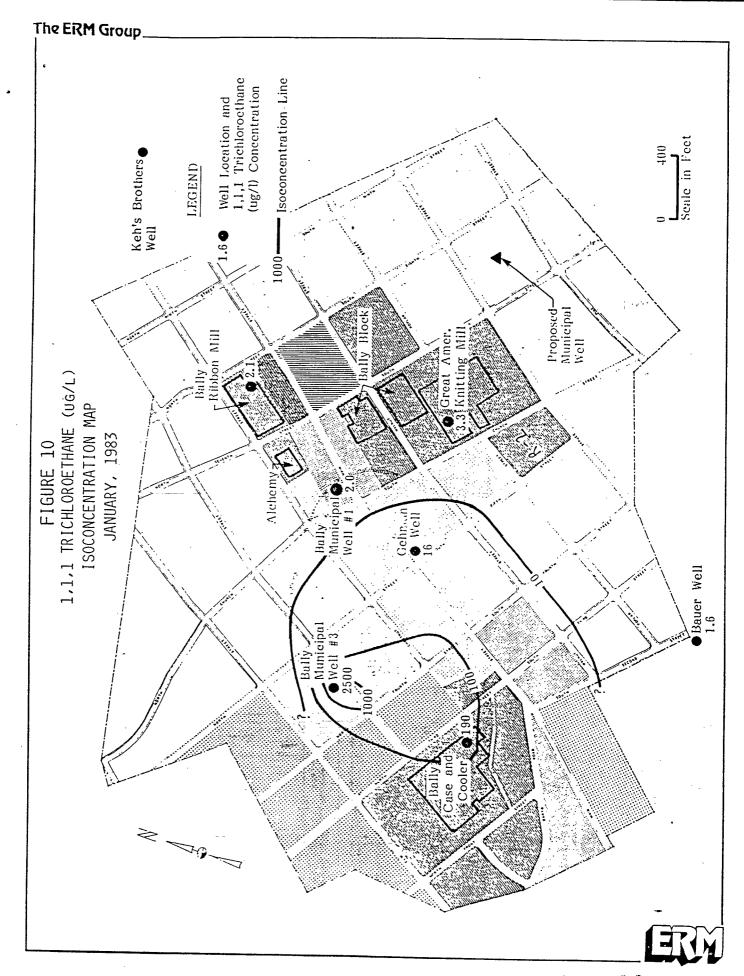
AR300019

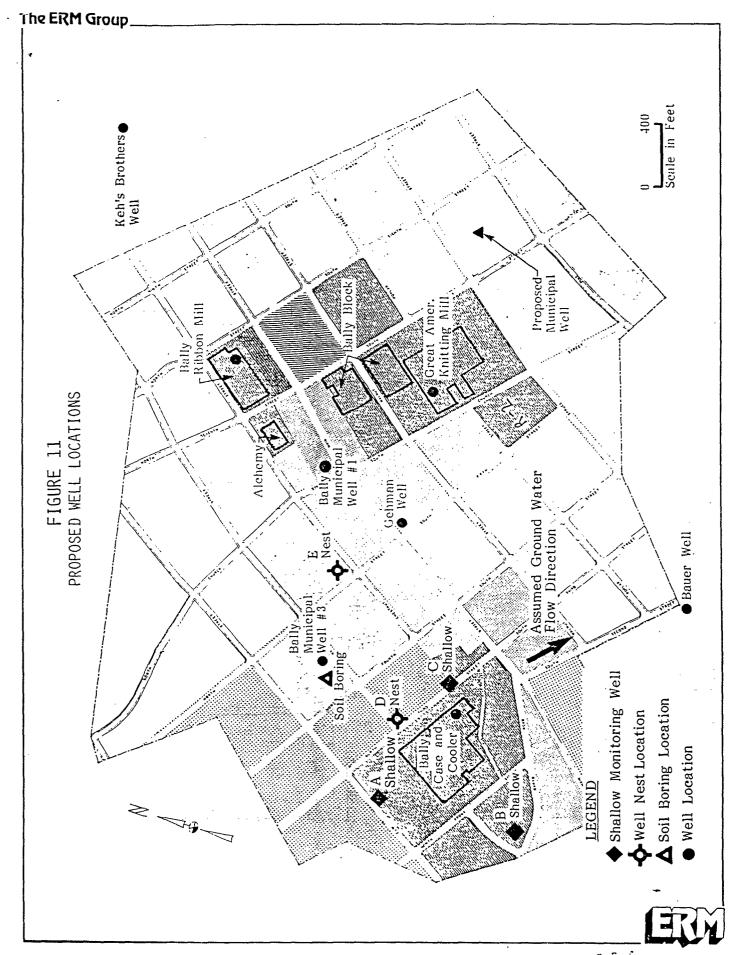


203020 **Ar300020**









HYDROGEOLOGIC INVESTIGATION OF THE

BALLY ENGINEERED STRUCTURES, INC. FACILITY

BALLY, PENNSYLVANIA

PHASE II REPORT

27 October 1986

Alan C. Funk, P.G. Project Manager

Francis D. Smith Project Geologist

Prepared By:

Environmental Resources Management, Inc. 999 West Chester Pike West Chester, Pennsylvania 19382

TABLE OF CONTENTS

			Ē	age
EXECUTIVE SUMMARY			j	
Section	1 - 1	ntroduction	1-1	L
	1.1	Background	J	L-1
	1.2	Purpose and Scope]	4
Section	2 - F	ield Investigation	2-1	L
	2.1	Monitoring Well Installation	2	2-1
	2.2	Soil Borings	2	2-5
	2.3	Ground Water Sampling	2	2-6
		2.3.1 On-Site	2	2-6
		2.3.2 Off-Site	2	2-8
Section	3 - F	Results	3-]	L
	3.1	Site Geology	3	3-1
	3.2	Site Hydrogeology	3	3 - 5

TABLE OF CONTENTS (continued)

	3.3	Analytical Results		3-15
		3.3.1	Soil Borings	3-15
		3.3.2	On-Site Wells	3-15
		3.3.3	Off-Site Wells	3-22
Section	4 - Co	onclusion	ns	4-1
Section	5 - Re	eferences	5	5-1
Appendix		-	· -	
Appendix		aborato: Records	ry Analyses and Chain-of-Custody	
Appendix	c - ç	uality A	Assurance Program	

LIST OF FIGURES

Figure		Page
1-1	Site Location Map	1-2
2-1	Site Map with Well And Boring Locations	2-2
2-2	Monitoring Well Construction Schematic	2-4
2-3	Off-Site Well Sampling Locations	2-10
3-1	Fracture Trace Map	3-3
3-2	Geologic Map	3-6
3-3a	Ground Water Elevation Contour Map May 14, 1986	3-8
3-3b	Ground Water Elevation Contour Map August 15, 1986	3-9
3-3c	Schematic Diagram of Ground Water Conditions	3-12
3-4	Hydrogeologic Cross-Sections	3-13
3-5	On-Site Monitoring Wells Isoconcentration Map - Total Chlorinated Volatile Organics	3 - 19

LIST OF FIGURES (continued)

Figure		Page
3-6	Off-Site Wells Isoconcentration Map - Total Chlorinated Volatile Organics	3-23
3-7	Off-Site Wells Isoconcentration Map PADER 1983 Sample Survey	3-24
3-8	Total VOCs in Municipal Well No. 1	3-27

LIST OF TABLES

Table	·	<u>Page</u>
2-1	Off-Site Well Sampling Locations	2-9
3-1	Ground Water Elevations	3-10
3-2	Soil Sample Laboratory Results	3-16
3-3	On-/Off-Site Wells - Sampling Results	3-17

EXECUTIVE SUMMARY

Environmental Resources Management, Inc. (ERM) has been retained by Bally Engineered Structures to provide professional hydrogeological consulting services relative to the investigation of ground water contamination by chlorinated solvents in the Borough of Bally, Pennsylvania's former Municipal Water Supply Production Well No. 3. ERM subsequently developed a two phase program to meet Bally Engineered Structures objectives of defining the possible sources of contamination and potential liability with regard to the Municipal Well No. 3 contamination.

This report presents the results of ERM's Phase II investigation to determine the ground water conditions in and around the Bally Engineered Structures Facility. The results of the Phase I investigation, which involved a study of existing data regarding the Bally Municiapl Well No. 3 contamination, were presented in a letter report to Bally Engineered Structures, dated 16 January 1986.

To conduct this study, ERM installed five on-site and two off-site monitoring wells to define the ground water flow direction and to detect any contaminants. These wells and 13 selected off-site water supply wells were sampled for volatile organic compounds (VOCs). In addition, five shallow soil borings were conducted in a potential source area identified from 1969 aerial photographs and selected soil samples were analyzed for VOCs. The major conclusions of the Phase II investigation are:

- Water table elevations collected from the ERM installed monitoring wells indicate that the principal ground water flow direction in the plant area is to the

northeast. The hydraulic gradient increases rapidly on the northeastern side of the site. This increase is considered to be a result of downgradient pumping at Bally Municipal Well No. 1 and various industrial wells.

- Chemical analyses of samples from the on-site monitoring wells and the former Bally site well show contamination, principally by chlorinated volatile organic solvents. Given the configuration of the contaminant plume and the ground water flow direction defined from two sets of ground water levels taken three months apart, it is concluded that the source area for these compounds is located at the Bally Engineered Structures Plant site.
- Given the ground water flow direction, the similarity in contaminants found off-site to those found on-site, and the total chlorinated volatile organic compound isoconcentration plot for off-site wells sampled by ERM, it is concluded that the Bally plant is the primary source for chlorinated volatile organic compounds found downgradient of the site for an indeterminant distance.
- High volume pumpage (300 gpm) of Municipal Well No. 3 when it was on-line from 1979 to 1982 induced contaminant migration towards the well, primarily along bedding planes aligned with the source area at the plant.
- The original pumpage of Municipal Well No. 3 from 1979 to 1982 confined the majority of the contamination emanating from the Bally plant. This pumpage prevented

any large scale contaminant migration along the principal ground water flow direction to the northeast. This flow orientation is towards the proposed Borough of Bally municipal well location and the eventual discharge point is the West Branch of the Perkiomen Creek.

- Contaminant levels in Bally Municipal Well No. 1 and other contaminated downgradient wells have increased significantly between the 1983 and 1986 samplings. Contaminant levels in these wells will continue to increase unless remedial action is taken. Installation and operation of the proposed new municipal well in the location presently being considered will accelerate and spread the existing contaminant plume further.
- Aerial photography indicates that plant areas may have been used for waste storage, especially during the 1950's and '60s. These areas are no longer used for waste storage, and have been filled or covered. There are no signs of ongoing or recent waste disposal activities on the property.

SECTION 1

INTRODUCTION

1.1 Background

Bally Engineered Structures retained Environmental Resources Management, Inc. (ERM) in September 1985 to provide professional hydrogeological consulting services relative to the investigation of ground water contamination by chlorinated solvents in the Borough of Bally Municipal Water Supply Production Well No. 3.

The problem was discovered when water quality analyses of samples taken in October 1982 from the two municipal water supply production wells (No. 1 and No. 3) that supplied the Borough of Bally, Pennsylvania revealed that Well No. 3 contained elevated concentrations of 1,1,1 Trichloroethane and Trichloroethene, both common industrial degreasers. Well No. 3 was taken off-line on 10 December 1982. Subsequent investigations by the Pennsylvania Department of Environmental Resources (PADER) were discussed in an Internal Report of 28 March 1983. This report, which was made available to ERM, included an industrial survey of all businesses within the vicinity of Municipal Well No. 3, and suggested that the Bally Engineered Structures Facility, located at the southern edge of the Borough (Figure 1-1), was the most likely source of the contamination. Bally Engineered Structures was notified of the findings in a PADER letter dated 25 August 1983. On 26 January 1984, Bally Engineered Structures met with DER to discuss the situation, develop some strategy for ground water

recovery, and discuss possible sources of funds for additional studies. A subsequent "Superfund" study of the site was performed by NUS Corporation and was completed 20 September 1985.

ERM subsequently developed a phased program to meet Bally Engineered Structures objective of defining the possible sources of the on-site contamination and the Well No. 3 contamination.

The scope of each phase was defined as follows:

- Phase I Obtain and evaluate all pertinent existing data on the Well No. 3 contamination and Bally plant operations.
- Phase II Based on the Phase I results, conduct a comprehensive on-site and off-site hydrogeologic investigation to determine the ground water conditions in and around the Bally facility.

Phase I review of the surface areas and plant operations included some examination of aerial photographs from periods of prior ownership. Bally Engineered Structures, Inc. began operations in the early '80s, and our review does not indicate any onsite waste disposal operations during this timeframe. Aerial photographs do suggest onsite waste storage and disposal during the 1940's, '50s and '60s. Such indicated disposal areas have either been covered or filled, but waste dispositions remain unknown. EPA has collected further imagery which may corroborate onsite waste disposal by prior owners and operators of the site. Phase II was intended to determine whether prior onsite activities produced ground water contamination.

1.2 Purpose and Scope

To further define the subsurface hydrogeologic conditions at the Bally facility and to establish the extent of any ground water contamination at the plant and surrounding area, the following tasks were performed by ERM:

- Installation of seven ground water monitoring wells.
- Measurement of one round of ground water elevations from the newly installed monitoring wells.
- Collection of one round of ground water samples from the newly installed monitoring wells.
- Collection of one round of water samples from thirteen selected off-site water supply wells.

This report presents a summary of the activities performed by ERM for Phase II that includes the results and the conclusions drawn from the on- and off-site hydrogeologic investigation. Results of ERM's Phase I investigation were summarized in a letter report to Bally Engineered Structures dated 16 January 1986.

SECTION 2

FIELD INVESTIGATION

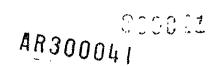
2.1 Monitoring Well Installation

In order to obtain a more complete picture of the subsurface conditions at the site, a total of seven ground water monitoring wells; numbered 86-1, 2, 3S (shallow), 3D (deep), 4, 5S, and 5D; were installed for the Phase II field investigation. Five of these wells were installed on the Bally Engineered Structures property and included three shallow (approximately 50 feet deep) wells (Nos. 86-1, 2, and 4) and one shallow and deep (approximately 150 feet deep) well nest (Nos. 86-3S, 3D). An additional shallow and deep well nest (Nos. 86-5S and 5D) was installed on the grounds of the Bally Municipal Park located approximately 580 feet north of the Bally Engineered Structures plant site. All ERM installed monitoring well locations are shown in Figure 2-1.

All monitoring wells, except 86-2, were drilled using the air hammer drilling method by C.S. Garber and Sons of Boyertown, Pennsylvania. Because of caving conditions, Well 86-2 was drilled by the Walton Corporation of Newark, Delaware using the hollow stem auger drilling method.

The four shallow monitoring wells (86-1, 3S, 4, 5S) that were used to monitor shallow ground water were drilled using an eight-inch drill bit to a depth of approximately twenty feet below the water table. All shallow monitoring wells were screened with approximately 30 feet of four-inch ID PVC Schedule 40 well screen (20 slot) and sufficient solid four-inch ID PVC Schedule 40 well casing to extend the screen to ground surface. All well screens were sand packed with clean graded sand to elevations two to three feet above the top of the screen and then sealed with a minimum two-foot thick bentonite seal. were then grouted in place with a cement slurry to ground surface. A schematic showing the typical shallow well construction is presented in Figure 2-2. Two of the shallow wells (86-1 and 55) were completed as flush mounts with 12-inch ID manhole covers, sanitary seals, and locking cast aluminum well caps to provide security and prevent surface water infiltration. The other two shallow wells (86-3S and 4) were completed with five-foot long six-inch ID carbon steel protective casings that were cemented in place and topped with locking cast aluminum well caps.

Two deep bedrock monitoring wells (86-3D and 5D) were installed adjacent to shallow monitoring wells 86-3S and 86-5S. After drilling to a depth of approximately 98 feet below ground surface into competent bedrock with an eight-inch hammer bit, the borings were cased with 100 feet of 6.25-inch ID welded joint carbon steel well casing. The casing was then pressure grouted in place with a cement slurry to insure that the annular space at the bottom of the well casing was sealed. After grouting, the wells were completed by drilling six-inch diameter open bore holes to depths of 150 and 165 feet below ground surface in wells 86-3D and 5D, respectively. Well 86-3D was completed with a locking cast aluminum well cap. Well 86-5D was completed as a flush mount with a 12-inch ID manhole cover, sanitary seal, and locking



6 Inch

Open Borehole

Bedrock

cast aluminum well cap. A schematic depicting the typical deep well construction is presented in Figure 2-2.

Monitoring well 86-2, located at the rear (north-west side) of the plant, was drilled using six-inch ID hollow stem augers to eliminate caving of the drill hole which was encountered at this location while using the air hammer drilling method. Split spoon soil samples (ASTM 1586) were taken at five-foot intervals for materials description. A shallow monitoring well, consisting of 20 feet of two-inch ID PVC Schedule 40 well screen (10 slot) and 30 feet of solid two-inch ID PVC Schedule 40 well casing was installed in the boring. The annular space around the screen was sand packed with clean graded sand to a level one foot above the top of the slots and sealed with a one foot thick layer of bentonite pellets. The well was then back-filled with drill cuttings to a depth of ten feet and grouted from ten feet to ground level. The installation was completed with a flush 10-inch manhole cover and two-inch sanitary seal to prevent surface water infiltration.

All site monitoring wells were developed with compressed air by ERM field personnel for approximately one hour each using a 100 cfm air compressor and hose. Finally, all monitoring wells at the Bally Engineered Structures site were surveyed by a licensed surveyor for top of casing elevation and horizontal location.

2.2 Soil Borings

Aerial photographs taken on 2 May 1969 were analyzed during the Phase I investigation of the Bally plant and surrounding area. The 1969 photos revealed the presence of a disturbed "dirt area", located approximately 315 feet southwest of the present location of Bally Municipal Well No. 3 and 500 feet north of the main plant building. In the photographs, the area was oval shaped and

was approximately 225 feet long and 140 feet wide with a road running from the area along the northwestern edge of the Bally Engineered Structures property.

Drilling and sampling was conducted on 1 and 2 May 1986 to determine if the location was a potential source area for the chlorinated solvents found in Municipal Well No. 3. A total of five shallow soil borings were located in this dirt area. soil borings were performed by the Walton Corporation of Newark, Delaware and logged by an ERM hydrogeologist. The soil borings were conducted using six-inch ID hollow stem augers with (1) continuous split spoon soil samples (ASTM 1586) taken to a depth of ten feet, and (2) spoon samples taken at five foot intervals from 10 to a maximum of 25 feet, or to auger refusal if encountered prior to 25 feet. Figure 2-1 shows the soil boring locations. All split spoon samples were collected in laboratory prepared and labelled glass sample jars. After collection, the head space in the sample jars was analyzed using an organic vapor meter with a flame ionization detector to measure total volatile organic concentration. Those samples that had total volatile organic concentrations above background were selected to be analyzed by Lancaster Laboratories of Lancaster, Pennsylvania to identify any volatile organic compounds (VOCs).

2.3 Ground Water Sampling

2.3.1 On-Site Sampling

The seven, newly installed, on-site ground water monitoring wells and the Bally Engineered Structures former site well were sampled by ERM on 12 and 13 May 1986 according to the following procedures.

- 1) A depth-to-water measurement was taken from a top of casing reference point for each well.
- 2) All monitoring wells, except 86-2, were purged using a 3.75-inch 0.5 horsepower stainless steel submersible pump with a flexible PVC discharge line. A minimum of three volumes of water was pumped from the well bore. The pump and hose were decontaminated by rinsing with clean water between each well. Well 86-2, a two-inch ID well, was purged using a dedicated 1.25-inch ID by two-foot long PVC bailer.
- 3) After well purging, ground water samples were obtained using new, dedicated 1.25-inch ID by two-foot long PVC bailers that were decontaminated with distilled water rinses before and after sampling.
- All samples from the on-site wells were collected using the appropriate EPA chain-of-custody procedures and placed in laboratory supplied, cleaned, and labelled 40 ml glass vials with teflon septa and no head space. The sample labels contained the following information: sample identification, date and time collected, sampler's initials, job name.
- 5) All samples were stored at 4 °C in an insulated cooler until they were delivered to the laboratory for analysis.
- 6) All on-site ground water samples were analyzed by Lancaster Laboratories of Lancaster, Pennsylvania for a full volatile organic compounds scan.

2.3.2 Off-Site Sampling

A total of thirteen off-site wells surrounding the Bally plant were sampled by ERM on 13 and 14 May 1986. These thirteen wells included five commercial wells, six residential wells, one on-line public supply well, and one off-line public supply well. A listing of off-site wells sampled and the sampling dates is presented in Table 2-1. The off-site well locations are shown in Figure 2-3.

The procedure for sample collection was as follows:

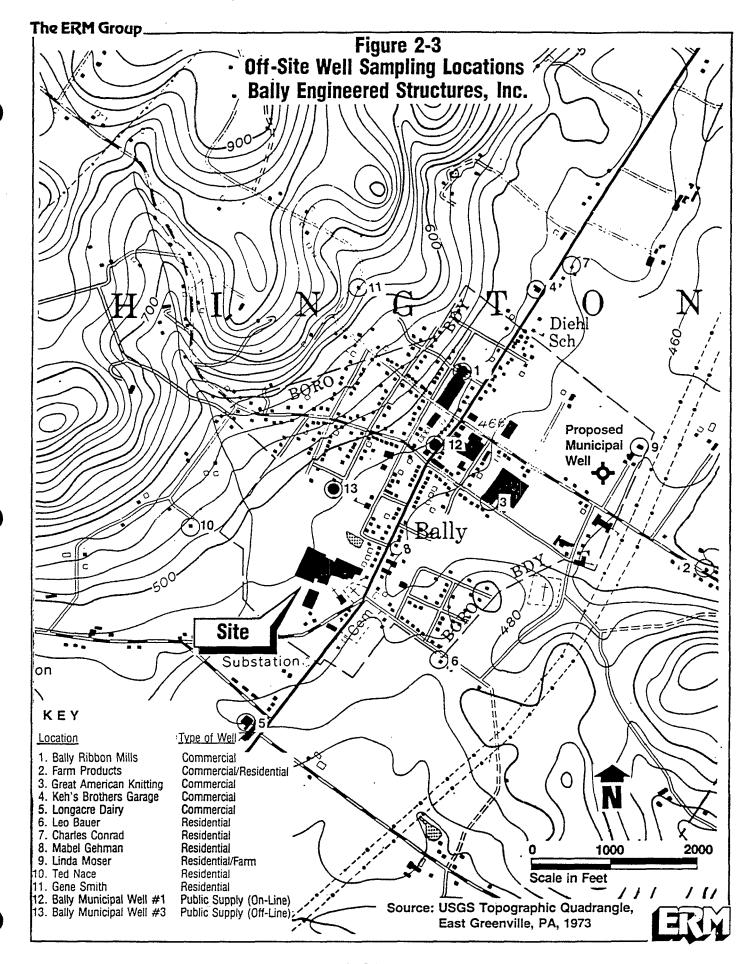
- At each off-site well, the water sample was taken at the closest tap to the well pump outlet line.
- 2. In order to insure that a representative ground water sample was obtained, the sampling outlet was allowed to run until the water temperature stabilized. Stabilization usually occurred within five to ten minutes.
- 3. All off-site ground water samples were collected using the appropriate EPA chain-of-custody procedures and placed in laboratory supplied, cleaned, and labelled 40 ml glass vials with teflon septa and no head space.
- 4. All samples were stored at 4 °C in an insulated cooler until they were delivered to the laboratory for analysis.
- 5. All off-site ground water samples were analyzed by Lancaster Laboratories of Lancaster, Pennsylvania for a full volatile organic compounds scan.

TABLE 2-1

Off-Site Well Sampling Locations

Name of Contact	Leo Bauer	Paul Eggerling	Charlie Benfield	Henry Kehs	Newt Longacre							Gene Smith	Gene Smith
Address	7th & Main St, Bally	Box 146, Bally	131 S. Church, Bally	Box 126, Bally	RD 1, Barto	S. 2d St, Bally	Star Rt, Box 5,Bally	504 Main St, Bally	Box 102, Bally	RD 1, Barto	Box 187, Bally	Borough Hall, Ball γ	Borough Hall, Bally
Date Sampled	5/13/86	5/13/86	5/13/86	5/13/86	5/14/86	5/13/86	5/13/86	5/14/86	5/13/86	5/14/86	5/13/86	5/14/86	5/14/86
Type of Well	Commercial	Commercial/Res.	Commercial	Commerical	Commercial	Residential	Residential	Residential	Res./Farm	Residential	Residential	Public Supply (on-line)	Public Supply (off-line)
Location	Bally Ribbon Mills	Farm Products	Great American Knitting	Kehs Brothers Garage	Longacre Dairy	Leo Bauer	Charles Conrad	Mabel Gehman	Linda Moser	Ted Nace	Gene Smith	Bally Municipal No. 1	Bally Municipal No. 3
Map No.	~	7	က	4	2	9	7	æ	6	10	11	12	13

NOTE: Locations plotted on Figure 2-3.



SECTION 3

RESULTS

3.1 Site Geology

Based on the Geologic Map of Pennsylvania (1980), the SCS Soil Report for Berks County (Ackerman, 1970), Longwill and Wood (1965), and previous reports by NUS (1985) and PADER (1983); the site lies near the border of two physiographic provinces that occur within the boundaries of the Borough of Bally. The hills to the northwest of the Bally Engineered Structures plant are composed of igneous and metamorphic rock units of the Reading Prong, which is a section of the New England Physiographic Province. Elevations along these rounded irregular ridges reach approximately 1000 feet above mean sea level. The rocks of the Reading Prong consist of Precambrian Age crystalline and metamorphic units that have been mapped as granitic gneisses and hornblende gneisses. The Cambrian Age Hardyston Formation is also found in these deposits and is composed of quartzite. Another Cambrian Age unit also found here is the Leithsville Formation, a massive dolomite with shale interbeds.

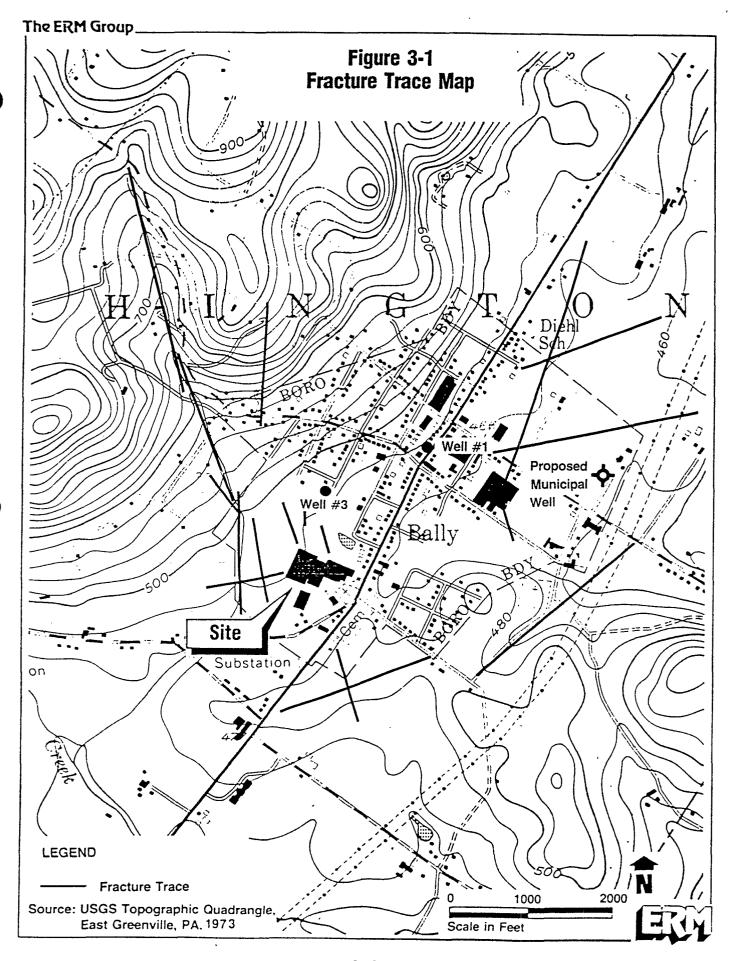
The Bally Engineered Structures plant site is situated at the toe of these Precambrian and Cambrian Age hills at an elevation of approximately 480 feet above mean sea level. The plant buildings and surrounding property lie on an area of low rolling hills composed of younger age sedimentary rocks that form the Triassic

Age Lowlands section of the Piedmont Upland Physiographic Province.

The principal formation comprising the Triassic Lowlands is the Brunswick Formation, which consists of red brown shales, mudstones, and siltstones. In the Bally area, Triassic Age limestone fanglomerates are found extensively interbedded with the Brunswick Formation Shales. The fanglomerates are composed of limestone breccias consisting of angular gray limestone pebbles in a reddish brown to buff, fine grained, sandy to argillaceous matrix. Some pebbles of quartzite and other rocks are also present.

Conlin and Gray Associates of Lancaster, Pennsylvania (consulting geologists for a nitrogen contamination problem at the Longacre Dairy [south of site] in 1975) collected strike and dip measurements on an outcrop of the Erunswick Shale located along the Northwest Branch of the Perkiomen Creek (approximately 0.3 miles southwest of the site). The measurements, reported in a 2 August 1975 letter to the Dairy and on file with the PADER, indicated that the strike of the bedding planes at the outcrop was N 15° W with a dip of 45° SW. The most prominent joint set in the outcrop was reported as striking N 65°W and dipping 85° N. A less well developed joint set was reported as striking N 25° W and dipping 75° NE. These field measurements agree with the linear trends reported by ERM for the air photo fracture trace study conducted during the Phase I investigation (Figure 3-1).

Analysis of the Geologic Map of Pennsylvania indicates that the strike and dip measurements recorded for the Brunswick Shale outcrop by Conlin and Gray Associates does not conform to the regional trend of northeast to southwest oriented ridges and valleys. There are two possibilities for this disagreement:



- 1. There is a fault zone (unmapped) at the contact of the Precambrian and Triassic Age units. The outcrop measured for strike and dip may be located close to this contact.
- 2. A circular shaped Triassic Age diabase intrusion (ring dike) located 5.2 miles southeast of the Bally site may have affected the attitude of the bedding around the plant area.

Drilling logs for the ERM installed monitoring wells and soil borings are attached in Appendix A. Based on the results of the soil borings and drilling at the site, the near subsurface (0 to 10 feet) consists of a tan to brown soil layer with traces of gravel. According to the SCS Soil Survey for Berks County (Ackerman, 1970) these soils are alluvial in nature and are derived from the Precambrian Age Granitic Gneiss hills located upgradient from the Bally Engineered Structures site. These soils are underlain by red brown clays to silty clays derived from the weathering of the underlying Brunswick shale units.

These red brown clays are present in thicknesses ranging from 21 feet at the rear (northwest) side of the plant grounds to five feet at the front (southwest) side of the plant. The shale content of these clays increases with depth until mostly shale is found at depths ranging from 10 to 85 feet below ground level. Weathered shale was penetrated in three borings at 25, 47, and 50 feet located west (86-1) and east (86-3, 86-4) of the plant. This shale became more competent with depth and eventually graded into fanglomerate at 60 to 98 feet below ground surface. On the northeast side of the plant (Well 86-3D) the fanglomerate changed to red and gray shales at a depth of 100 feet. In the area of Municipal Well No. 3 (Well 86-5D), weathered shale was penetrated at 85 feet and graded into fanglomerate at 98 feet below ground

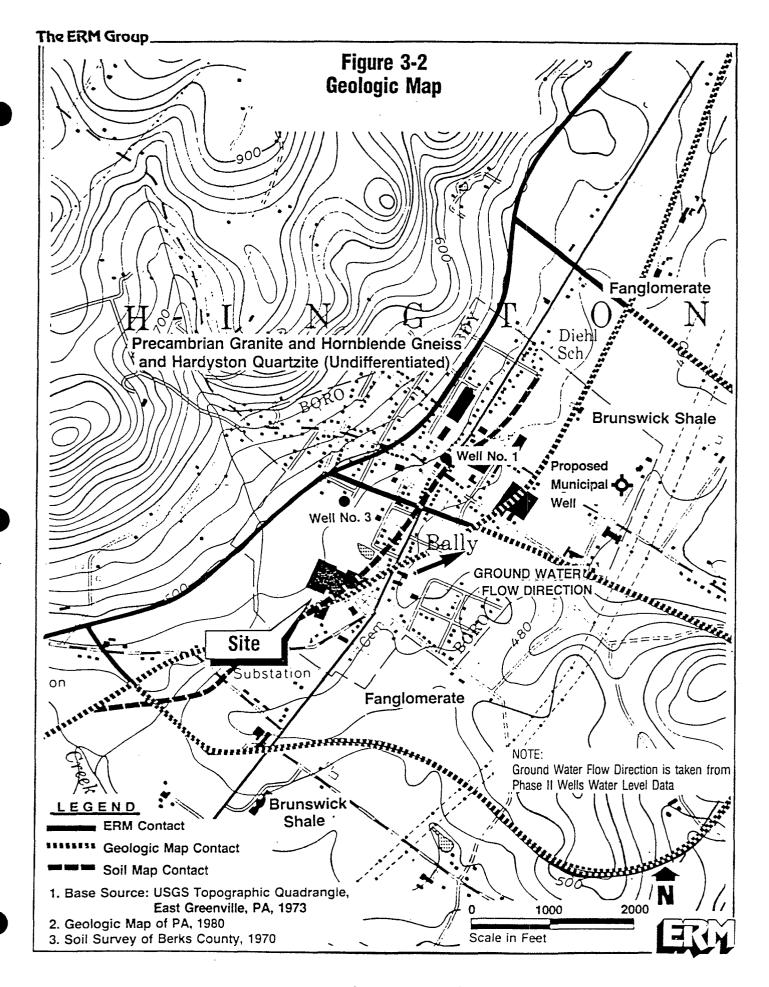
level. No shale was penetrated beneath the conglomerate in Well 86-5D before the boring was terminated at 165-feet.

As discussed in ERM's report of its Phase I investigation, the location of the contacts between the various geologic units at the site was in question, because the position of these contacts was thought to potentially have an influence on the direction and volume of ground water flow around the plant site. Based on the materials penetrated during drilling at the Bally plant site, the contact between the Precambrian and Cambrian Age Igneous and Metamorphic units and the Triassic Age Sediments occurs at some point northwest of the plant property line and not at the northeastern corner of the site, as reported in the available literature (Figure 3-2). In addition, the plant itself is lying mainly on Triassic Age Shale and Fanglomerate that are the water bearing units for Bally Municipal Well No. 3 (based on the driller's log for Well No. 3 and logs for the two monitoring wells installed by ERM 230 feet east of Bally Municipal Well No. 3, 86-5S and 5D).

3.2 Site Hydrogeology

ERM's interpretation of the ground water conditions in the study area and the interrelationship of these conditions on the distribution of contaminants at the Bally Engineered Structures Site is based on the following:

- Field Observation during the drilling program.
- Collection of two rounds of water level measurements from the monitoring wells.
- Pumping/sampling of the monitoring wells.



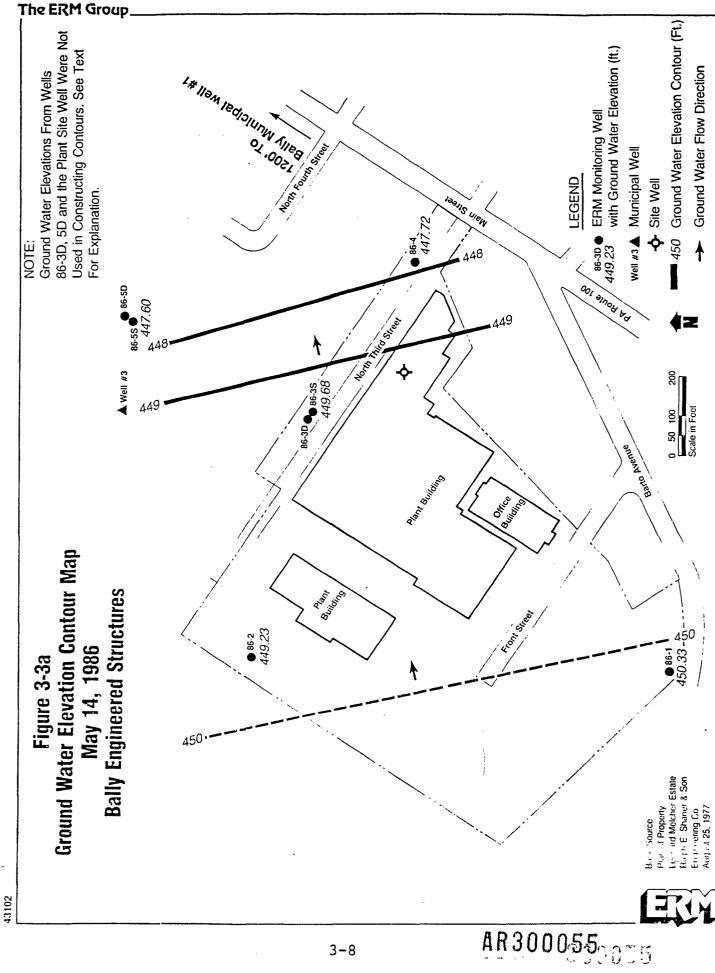
- Results of the chemical analyses on the ground water samples.

Ground water table contour maps were constructed based on water level data collected from the shallow monitoring wells in May and August of 1986. These maps are presented in Figures 3-3a and 3-3b. Ground water level measurements for all the ERM installed monitoring wells and the former site well are contained in Table 3-1.

As Figure 3-3a illustrates, ground water flow at the site during May 1986 was oriented to the northeast with a gradient of about 6.3 ft/mile across the majority of the plant site that increased to about 31.7 ft/mile at the northeast portion of the property. Figure 3-3b is a representation of the ground water table in August of 1986. As the map illustrates, ground water flow is still to the northeast with a gradient of about 7.9 ft/mile across the plant that increases to 60.0 ft/mile at the northeast edge of the property. The rapid increase in gradient on the northeastern edge of the property is interpreted to be the edge of a cone of depression developed from active pumping of downgradient wells, including the Bally Municipal Well No. 1, the Bally Ribbon Mill Well, and the Great American Knitting Well.

As the ground water table contour maps illustrate, the August 1986 ground water elevations are 2 to 3 feet below the May 1986 levels. This decrease in water table elevation can be attributed to the below normal rainfall for June and July of 1986 that resulted in a decrease in ground water recharge for this period.

In constructing the maps, water level data from the deep monitoring Wells (86-3D and 5D) and the Bally Engineered Structures Site well were not used. The May and August readings for monitoring wells 86-3S and 86-3D were different by only 0.02



-

The ERM Group 445 Ground Water Elevation Contour (Ft.) 86-3D, 5D and the Plant Site Well Were Not 441.22 with Ground Water Elevation (ft.) Used in Constructing Contours. See Text 1200-7 OCT VIDEN VINE WELL #1 Ground Water Flow Direction Ground Water Elevations From Wells (Dashed Where Inferred) >86-5 ● ERM Monitoring Well Joseph Mon Company well #3▲ Municipal Well ♦ Site Well LEGEND For Explanation. leasts view ł NOTE: 445.60 86-55 441.22 Opi sinos pa Tools of the State 446.35 ▲ Well #3 8 445 86-3D 0 50 100 Scale in Feet 446 Barto Avenue Pan Building dice **Ground Water Elevation Contour Map Bally Engineered Structures** August 15, 1986 Building Figure 3-3b • 86-1 --446.35 Plan of Property Leonard Melcher Estate Ratur E. Shaner & Son Engineering Co August 25, 1977 Base Source:

TABLE 3-1

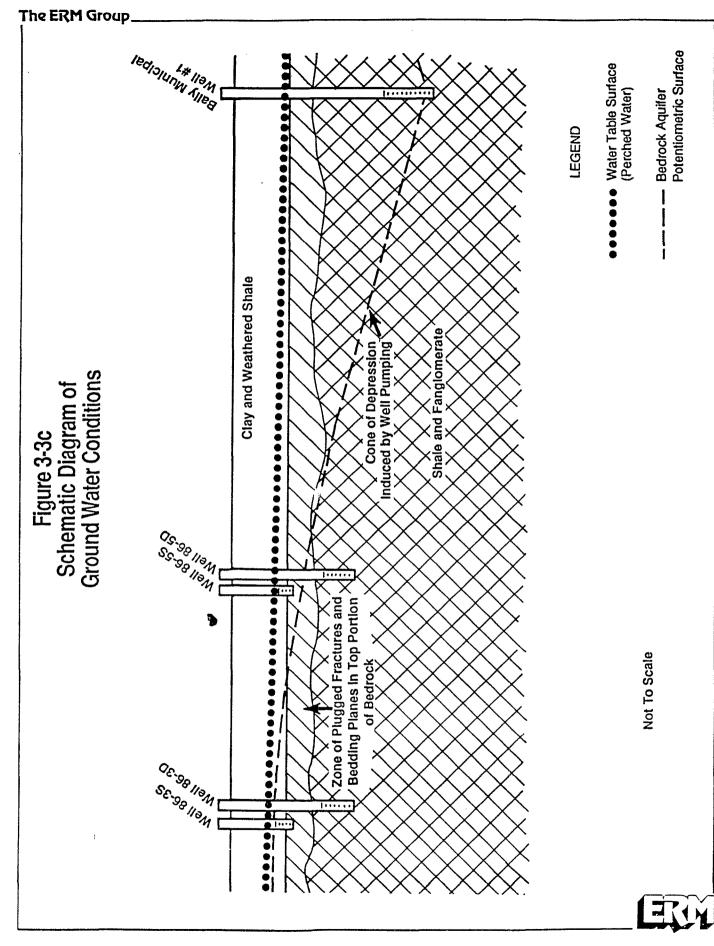
Ground Water Elevations
(all measurements in feet above MSL)

	Top	Depth	Depth	Ground	Ground
	of	to	to	Water	Water
WELL	Casing	Water	Water	Elevation	Elevation
NO.	Elevation	5-14-86	8-15-86	5-14-85	8-15-86
86-1	462.53	12.20	16.0	450.33	446.53
86-2	475.43	26.20	28.09	449.23	447.34
86-3sl	467.09	17.41	20.74	449.68	446.35
86-3D ¹	467.08	17.38	20.72	449.70	446.36
86-4	456.61	8.89	11.61	447.72	445.00
86-5S ²	467.50	19.90	26.28	447.60	441.22
86-5D ²	468.16	20.86	23.37	447.30	444.79
Site Well	455.96	9.18		446.78	

lOn-site well nest
20ff-site well nest

and 0.01 feet, respectively, and therefore provide essentially the same data point (see Table 3-1). The ground water elevations for the Bally Engineered Structures Site well and deep monitoring well 86-5D were inconsistent with ground water elevations for the other monitoring wells (see Table 3-1). These differences in ground water elevations are interpreted as being a result of drawdown of the potentiometric surface of the bedrock aquifer from pumping wells north and northeast of the site combined with a zone of lowered permeability near the bedrock surface which results in a perched water table surface. Figure 3-3c illustrates this interpretation. Wells 86-3D and 86-5D are both cased off below the near surface water bearing zones and provide the potentiometric surface elevation for the deeper water-bearing zones in the bedrock aguifer. Wells 86-3S and 86-5S are screened in the clay and weathered shales and provide the water table elevation near the surface. Since the zone of lower permeability near the bedrock surface is "leaky", the water surfaces of the shallow and deep water-bearing zones equilibrate over time (as illustrated by Wells 86-3S and 86-3D). However, pumping from the bedrock aquifer causes drawdown of its potentiomentric surface followed by a slower drawdown response of the water table surface as the perched water begins to recharge the deeper water-bearing zone (as illustrated by readings from Wells 86-5S and 86-5D).

As mentioned in the previous section on site geology, the Bally plant is underlain by a thin layer of alluvial soils derived from weathering of the upgradient granitic gneiss bedrock that overlies reddish brown clays and shale. A hydrogeologic cross section is presented in Figure 3-4. The clay/weathered shale unit is the first water-bearing unit encountered below the site at depths of 5 to 50 feet below grade. This shallow flow system is generally unconfined and a water table exists in this unit as a subdued reflection of the surface topography. Depth to water ranges from 8 to 26 feet below ground surface.



The higher water yields (10 to 50 gpm) obtained from some of the monitoring wells screened in the clay/weathered shale zone during development and purging suggest that much of the secondary porosity (bedding, joints, fractures) of the underlying unweathered bedrock is retained in this unit, but weathering products tend to fill many of the secondary features and limit the shallow flow system transmissivity when compared to the underlying bedrock.

A deeper (>100 feet) bedrock aquifer is present below the clay/weathered shale. This deeper bedrock flow system is composed of red brown and gray shales at beginning depths of 25 to 73 feet that grade into limestone rich fanglomerates at depths of 60 to 73 feet. In the deeper unit, larger water yields are obtainable as the joints, fractures, and bedding planes in the rock are not filled with weathering products as in the shallow weathered material.

From drilling and well development observations, the fanglomerate unit is a better water producer than the shale. In the shale, the secondary openings controlling the ground water flow are reported by Longwill and Wood (1965) as being blocky, moderately developed, closely spaced, steeply dipping, and mostly open with some secondary quartz and calcite mineralization that impedes water production (50 gpm in well 86-3D). In the fanglomerate, the secondary openings are reported by Longwill and Wood (1965) as being poorly formed, moderately spaced, steeply dipping, open and have an irregular pattern. Abundant joint and solution enlarged openings in this unit provide a moderate secondary porosity and high permeability that results in increased water production (100 plus gpm in well 86-5D).

3.3 Analytical Results

3.3.1 Soil Borings

A total of five soil samples, taken from the disturbed 1969 "dirt area" adjacent to Bally Municipal Well No. 3, that showed elevated OVM readings above background were submitted to Lancaster Laboratories for analysis. The soil samples submitted for analysis are listed in Table 3.2, along with the results of the analyses. The laboratory analysis sheets are attached in Appendix B.

The analytical results indicate that only one soil sample, from boring TB-4 at a depth of 4.7 feet, had any detectable levels of volatile organics. The two compounds detected, Toluene at 20 ppb and Methylene Chloride at 30 ppb, are unrelated to the VOCL detected in the ground water samples taken from the on-site wells and Municipal Well No. 3 and are not used at the plant. Based on these results, ERM concludes that the former "dirt area" next to Bally Municipal Well No. 3 is not the source area for the chlorinated VOCs detected in this well.

3.3.2 On-Site Wells

A summary table of analytical results for the site monitoring wells is presented in Table 3-3. The proposed U.S. EPA Maximum Contaminant Levels (November, 1985) for various chlorinated volatile organic compounds in public water supplies are listed at the bottom of Table 3-3. Copies of the laboratory analysis sheets are attached in Appendix B. An isoconcentration map of the total chlorinated volatile organic compounds in the on-site monitoring wells is presented in Figure 3-5.

TABLE 3-2
Soil Sample Laboratory Results

Boring Number	Depth of Sample (ft)	Date Sampled	Compounds Detected (ppb)
TB-1	10	5/1/86	None
TB-1	15	5/1/86	None
TB-1	26	5/1/86	None
TB-3	8	5/2/86	None
TB-4	4.7	5/2/86	Toluene 20,
			Methylene Chloride 30

TABLE 3-3
ON-/OFF-SITE WELLS - SAMPLING RESULTS
(all results ppb)
(blank = none detected)

Well #	Date Sampled (1986)	Total Chlorinated Volatiles	1,1- Dichloro- ethene	1,1- Dichloro- ethane	Trans-1,2 Dichioro- ethene	Chloro- form	1,2- Dichloro- ethane	1,1,1- Trichloro- ethane	Trichloro- ethene	Tetra- chloro- ethene
86-1	5/12									
86-2	5/13									
86-35	5/12	1482	170	ဆ				1300	4	
86-30	5/12	670	130	240				210	06	
86-4	5/13	7244	570	7	g g	_	2	2300	4300	47
86-55	5/12	3						٣		
86-50	5/12	145	4					31	110	
Plant Site Well	5/13	240	01		12			- ==	170	37
Farm Products	5/13									
Gr. Amer. Knit.	5/13	43	٤					26	4	
Bally Rib. Mill	5/13	39	2					27	4	9
G. Smith Res.	5/13									
Kehs Bros.	5/13									
C. Conrad Res.	5/13	,								
L. Bauer Res.	5/13	,								
Moser Res.	5/13									
Gehman Res.	5/14	304	34					160	110	
Longacre Dairy	5/14									
Nace Residence	5/14									
Munic. Well #1	5/14	61	5					46	0	
Munic. Well #3	5/14	3509	360	4		-	_	2500	640	٣
PMLC*			7				2	200	5	ñ

^{*}PMLC: EPA Proposed MaxImum Contaminant Levels (11/85)

NOTE: Well locations shown on Figures 3-5 and 3-6.

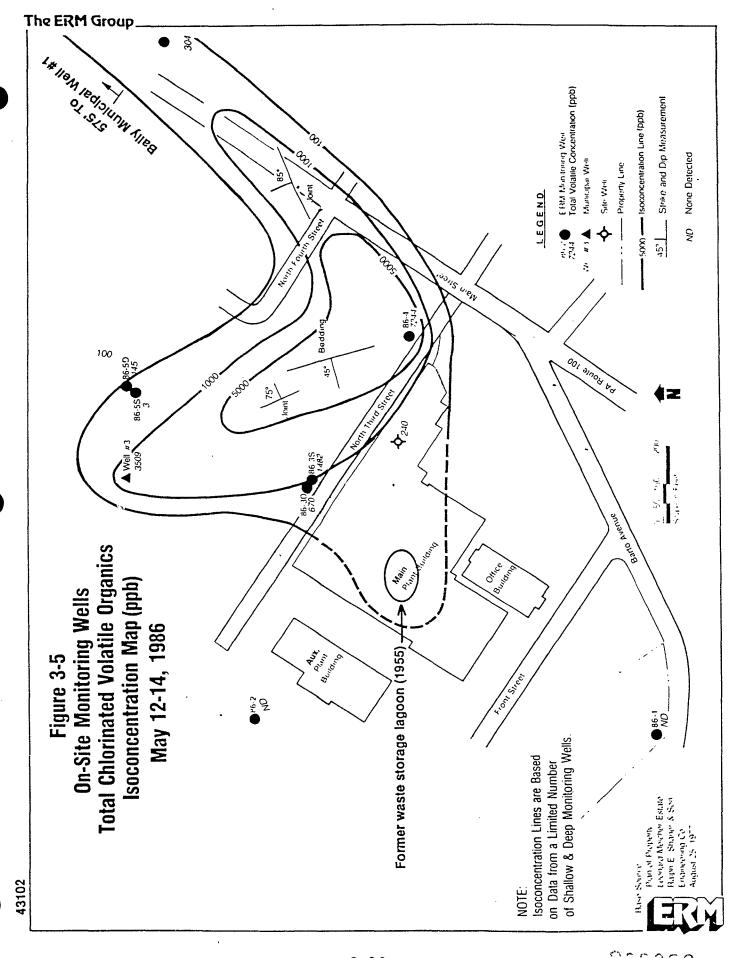
The analytical results indicate that the ERM installed monitoring wells 86-3S, 3D, 4, 5S, and 5D contain a number of volatile organic compounds, all of which are chlorinated. Specifically on a well-by-well basis, a number of interpretations can be drawn from the analytical results for the on-site monitoring wells. These interpretations are presented in this section.

Monitoring well 86-1, located on the southwestern edge of the Bally Engineered Structures property, contained no detectable VOCs. Monitoring well 86-2, located northwest of the plant buildings and upgradient in regard to the principal ground water flow direction, also had no detectable volatile organic compounds. The lack of any detectable levels of chlorinated VOCs in these two wells combined with the ground water flow direction at the site indicates that the detected VOCs in the ground water on-site do not have an upgradient off-site source area.

Along the northeast (North Third Street) side of the plant, the well nest consisting of 86-3S, a shallow well (47 feet), and 86-3D, a deep well (147 feet), had four identical chlorinated organic constituents; 1,1 Dichloroethene; 1,1 Dichloroethane; 1,1,1 Trichloroethane; and Trichloroethene. Total chlorinated volatile organic concentrations in these two wells were 1482 ug/l in well 86-3S and 670 ug/l in well 86-3D.

Ground water samples taken from well 86-4, located approximately 100 feet from the eastern edge of the plant site, contained eight chlorinated VOCs (Table 3-3) with a total volatile concentration of 7244 ug/l (highest total VOC level measured during this investigation).

The distribution of chlorinated VOCs in Wells 86-3S, 3D, and 4; located immediately adjacent to the main plant building,



indicates that the shallow weathered shale unit on the northeast side of the plant has a much higher concentration of chlorinated volatile organics than the deeper (greater than 100 feet) competent shale/fanglomerate bedrock unit. The distribution of these contaminant levels indicate that a confining or semi-confining layer is present in the vicinity of these wells that somewhat retards the migration of chlorinated organics into the deeper bedrock. Similarly, it is presumed that lateral flow rather than vertical flow is predominant above this semi-confining layer.

Monitoring wells 86-5S, a shallow well (64 feet), and 86-5D, a deep well (165 feet), both drilled approximately 230 feet due east of Bally Municipal Well No.3 and 580 feet northeast of the main plant building, had total chlorinated volatile organic concentrations of 3 and 145 ug/l, respectively. The principal contaminants in his area were 1,1 Dichloroethene; 1,1,1 Trichloroethane; and Trichloroethene.

The distribution of contaminants in these two wells and the total chlorinated volatile organic concentration of 3509 ug/l in Bally Municipal Well No. 3, which has its pump intake at 150 feet, indicates that the deep competent shale/fanglomerate bedrock in this off-site area is more contaminated than the overlying weathered shale. The contamination of the deep shale/fanglomerate bedrock in this area may be attributed to two causes:

- 1. Most chlorinated hydrocarbon compounds have specific gravities higher than water (e.g. TCE=1.45) and tend to migrate downward within a water-bearing zone.
- 2. The high volume pumpage (approximately 300 gpm) of Bally Municipal Well No. 3 when it was on-line from

1979 to 1982 altered the principal ground water flow direction away from the preferred northeast orientation and toward the northwest primarily along bedding planes and secondarily along joints towards Municipal Well No. 3; a condition called strike-parallel drawdown. Recharge waters, derived in part from water in the shallow weathered shale at the plant and driven by the significant head differences created by the well pumping, carried contaminants into the Municipal Well No. 3 area.

Figure 3-5 is an isoconcentration plot of total chlorinated volatile organics in the ERM installed shallow and deep on-site monitoring wells, the Bally Engineered Structures site well, and Bally Municipal Well No. 3. More detailed data, i.e. more wells on-site and in the downgradient flow direction from the plant, are necessary to determine the full extent of contamination in the shallow and deep flow systems.

The isoconcentration plot indicates that the area of highest concentration of total chlorinated VOCs is in the vicinity of Well 86-4. Based on the high total chlorinated VOC level in well 86-4, the distribution of chlorinated VOCs in the Bally Engineered Structures former site well and in the other ERM monitoring wells on-site and the ground water flow direction, ERM concludes that the source of these compounds is located at the Bally Plant site. Prior site investigations by PADER (1983) and NUS Corporation (1985), an EPA Superfund Contractor, have implied that a former liquid waste storage lagoon (see Figure 2-1) is the source of the chlorinated solvent contamination.

From analysis of 2 May 1955 air photos, ERM has determined that the former on-site waste storage lagoon was located under one of the current manufacturing areas of the plant (see Figure 2-1).

In addition, other potential solvent source areas include the current and past degreasing tank locations (also shown in Figure 2-1).

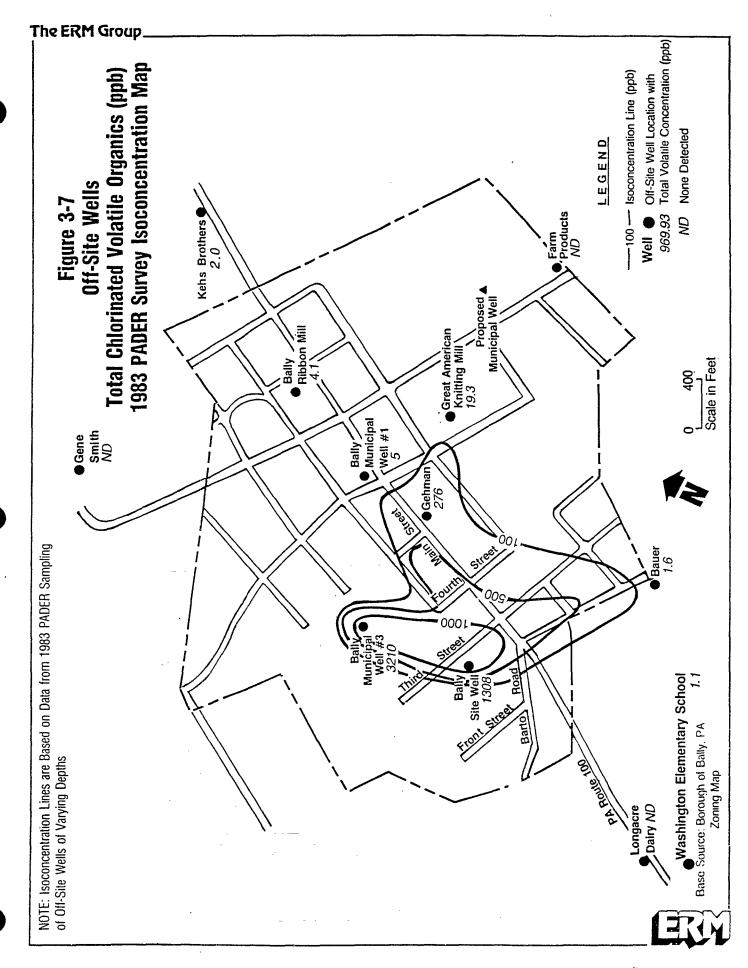
In summary, the distribution of total chlorinated volatile organics in the Bally plant site area is controlled by two factors: the principal ground water flow direction to the northeast and pumpage of Bally Municipal Well No. 3. High volume pumpage of the Municipal Well during the period from 1979 to late 1982 apparently altered the principal flow direction from the northeast to the northwest. This high volume pumpage created a strike-parallel drawdown condition that drew contaminants from the Bally plant area and into Municipal Well No. 3.

3.3.3 Off-Site Wells

A summary table of analytical results for the off-site wells sampled for the study is presented in Table 3-3. Copies of the laboratory analysis sheets are attached in Appendix B.

The analytical results for the off-site well survey indicate that the Bally Engineered Structures Site is the primary source area for the chlorinated solvents found in the off-site wells; principally 1,1 Dichloroethene; 1,1,1 Trichloroethane; and Trichloroethene. An isoconcentration map showing the direction of contaminant migration is presented in Figure 3-6. An isoconcentration map based on the PADER well survey conducted in the winter of 1983 is presented in Figure 3-7 for comparison.

The highest level of contamination off-site, based on total chlorinated volatile content, was found in the sample taken from Bally Municipal Well No. 3. The high chlorinated solvent level found in this well, 3509 ug/l, is due to past high volume pumpage



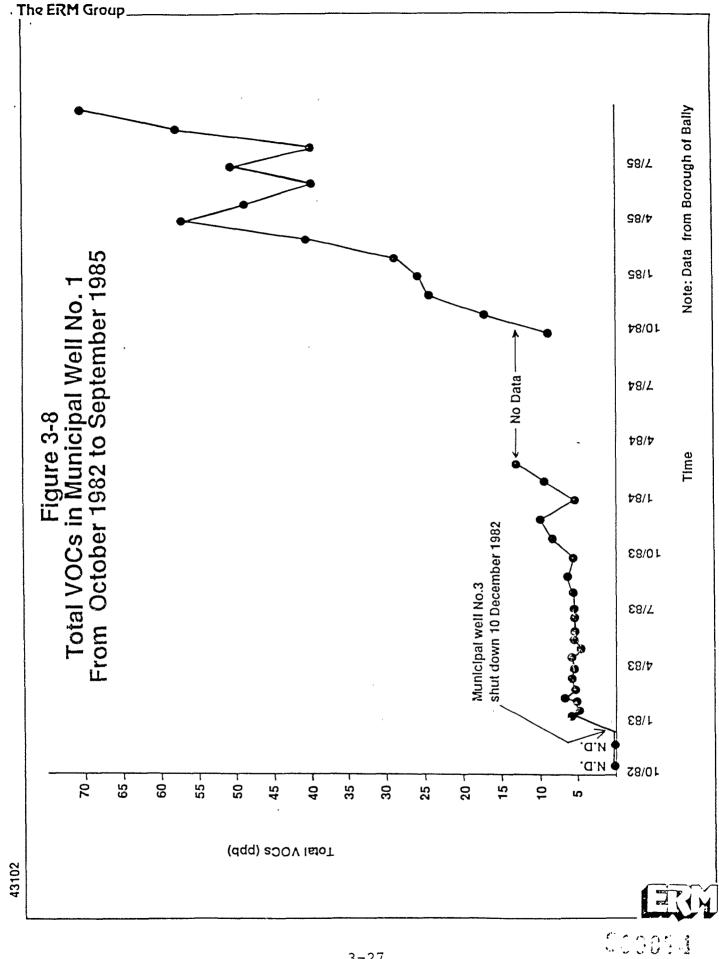
that drew contamination along bedding planes and a major joint set that is in line with the eastern corner of the plant where the highest on-site levels of contamination were found in Well 86-4. The second highest total chlorinated volatile level off-site, 304 ug/l, was found in the ground water sample taken from the Mabel Gehman well, which is in the preferential downgradient flow direction towards the northeast from the plant source area.

Low levels of chlorinated solvents were also detected at the Great American Knitting Mill Well, the Bally Ribbon Mill Well, and the Bally Municipal Well No. 1. A previous survey by the PADER in 1983 revealed no other major industrial users of the chlorinated solvents, besides Bally Engineered Structures, that were detected in the most recent ground water samples taken from the off-site wells. (Bally Ribbon Mills was shown to be a minor user of spot remover, presumed to be a solvent, in the PADER 1983 survey). Further information regarding the use of these materials at the plants will be required.

The Great American Knitting Mill Well had a total chlorinated volatile content of 43 ug/l. This well is located in the principal downgradient flow direction from the Bally Engineered Structures Plant. The well is also located along the major joint orientation, N 65° E, of the shale/fanglomerate bedrock determined by field measurements and which provides a preferential pathway for contaminant migration. Bally Municipal Well No. 1 located approximately 1,600 feet northeast of the Bally Engineered Structures Site and the Bally Ribbon Mill located approximately 1,000 feet northeast of Municipal Well No. 1 had total chlorinated volatile contents of 61 and 39 ppb, respectively. These wells are also located on major fracture orientations (Figure 3-1) that offer preferential pathways for contaminant migration.

It is important to note that the data from the off-site well samples from 1983 and 1986 indicate a trend of increasing contaminant levels in most of the downgradient wells. This trend is illustrated on Figure 3-8, which shows Municipal Well No. 1 total VOC levels versus time for the period of November 1982 to September 1985. ERM concludes that this trend has been caused in part by the inactivity of Municipal Well No. 3 which, when pumping, slowed the downgradient migration of contaminants towards Bally Municipal Well No. 1 and other wells. It is also concluded that this increase in downgradient contaminant levels (and spreading of the contaminant plume) will continue unless remedial actions are initiated. The proposed new municipal well is almost directly downgradient from the site and, if installed, would accelerate and spread contaminant migration towards it.

000013



3-27

SECTION 4

CONCLUSIONS

Based on the results of the Phase II investigation, ERM makes the following conclusions:

- Based on water table elevations collected from the ERM installed monitoring wells, the principal ground water flow direction is to the northeast. The rapid increase in hydraulic gradient on the northeastern side of the site is interpreted to be the edge of a cone of depression from pumping at Bally Municipal Well No. 1 and various industrial wells.
- The plant overlies Triassic Age shale and fanglomerate that are the water-bearing units in the site vicinity. Site borings confirm that the contact with igneous and metamorphic rock occurs northwest of the site.
- There are two water-bearing horizons at the site: a shallow clay/weathered shale unit, and a deeper competent shale and fanglomerate bedrock unit.
- Ground water elevation data indicate that, while there are differences in water levels (indicating hydraulic separation) between the shallow clay/weathered shale and the deeper competent shale and fanglomerate bedrock

to the north of the site, water levels in these units at the site are nearly identical. This condition is most likely a result of the drawdown of the bedrock aquifer potentiometric surface from pumping north and northeast of the site combined with the presence of a zone of lowered permeability near the bedrock surface (producing a perched water table above the bedrock aquifer cone of depression).

- Chemical analyses of the monitoring wells and the former Bally site well show contamination, principally by chlorinated volatile organic solvents. Given the configuration of the contaminant plume and the ground water flow direction defined from two sets of ground water levels taken three months apart, it is concluded that the source area for these compounds is located at the Bally Engineered Structures Plant site.
- Based on the chemical results of ground water samples from the site monitoring wells, the shallow clay/weathered shale at the plant is more contaminated than the deeper shale/fanglomerate bedrock. This condition indicates that there is some degree of confinement of contaminants by the shallow clay/weathered shale zone (and supports the interpretation of a perched water table in the study area).
- Given the ground water flow direction, the similarity in contaminants found off-site to those found on-site, and the total chlorinated volatile organic compound isoconcentration plot for off-site wells sampled by ERM, it is concluded that the Bally plant is the

primary source for chlorinated volatile organic compounds found downgradient of the site for an indeterminant distance.

- High volume pumpage (300 gpm) of Municipal Well No. 3 when it was on-line from 1979 to 1982 induced contaminant migration towards the well along bedding planes aligned with the source area at the plant.
- In the area of Bally Municipal Well No. 3, the deeper shale/fanglomerate bedrock is more contaminated than the shallow clay/weathered shale most likely in response to purging induced drawdown and the propensity for the higher density organics to migrate deeper with downgradient flow.
- The original pumpage of Municipal Well No. 3 from 1979 to 1982 contained the majority of the contamination emanating from the Bally plant. This pumpage prevented any large scale contaminant migration along the principal ground water flow direction to the northeast. This flow orientation is towards the proposed Borough of Bally municipal well location and eventually discharges into the West Branch of the Perkiomen Creek.
- Contaminant levels in Bally Municipal Well No. 1 and other contaminated downgradient wells have increased significantly between the 1983 and 1986 samplings. Contaminant levels in these wells will continue to increase unless remedial action is taken. Installation and operation of the proposed new municipal well in the

location presently being considered will accelerate and spread the existing contaminant plume further.

00073

SECTION 5

REFERENCES

- 1. Ackerman, F.S., 1970, Soil Survey of Berks County, Pennsylvania; USDA Soil Conservation Service; 125 pp.
- Conlin and Gray Associates, August 2, 1975, Letter report to Daniel Longacre, President, Longacre's Modern Dairy, Barto, Pennsylvania.
- 3. Environmental Resources Management, January 16, 1986, letter report on Phase I Investigation, Bally Engineered Structures, Inc., Bally, Pennsylvania.
- 4. Environmental Reporter, October 18, 1985, Proposed Standards, p. 1046.
- 5. Geologic Map of Pennsylvania, 1980, Commonwealth of Pennsylvania, Department of Environmental Resources, Topographic and Geologic Survey.
- 6. Longwill, S.M. and Wood, C.R., 1965, Ground-Water Resources of the Brunswick Formation in Montgomery and Berks Counties, Pennsylvania, Bulletin W22, Pennsylvania Geologic Survey, Harrisburg.

- 7. NUS Corporation, September 20, 1985, Preliminary Assessment and Site Inspection of Bally Case and Cooler Company, TDD No. F3-8308-33A, EPA No. Pa-942, Contract 68-01-6699.
- 8. Pennsylvania Department of Environmental Resources, March 28, 1983, Internal Report on Ground Water TCE Contamination, Borough of Bally, Washington Township, Berks County, 8-354-2413.
- 9. Pennsylvania Department of Environmental Resources, August 25, 1983, Letter form W.G. Stanley (PADER) to T.W. Pietrocini (Bally Engineered Structures).

Appendix A

Drilling Logs:
Monitoring Wells
Soil Borings

same, wet, no odor

rate: 3-5 gpm 48.0 to 8.0'

8.0 to G/L

48.0 to 8.0' 8.0 to 7.0'

7.0 to G/L

40-48.01

Screen Solid

Sand

Grout

Bentonite

Drilling Log

Entanoimental Mesoa	1662 110	inagement.		Drining Log
Project Bally Eng.	Structs	SOwner_	Allegheny Int.	Sketch Map
Location Bally, PA W.O. Number 431-02				
Well Number 86-2	Well Number 86-2 Total Depth 49' Diameter 6"			
Surface Elevation	Wa	ter Level: Initial	24-hrs	
Screen: Dia. 2"	Len	ngth 20 '	Slot Size10	
Casing: Dia. 2"	Ler	ngth30 *	Type PVC Sch. 40	lotes
Drilling Company Wal	ton Co	Drilling		lotes
Driller Paul Foley	Loc	Bv <u>F.D. S</u> mi	th Date Drilled 5/1/86	
Depth (Feet) Graphic Log Well Construction	Sample Number		Description/Soil Classific (Color, Texture, Structu	
L 0-1 - 1		0-2.0'	Gravel fill	
	- 4	2.0-4.0'	Gravel fill with grey bro	wn clay, wet, no odor
0 0 0 A A	2-6-8 *	4.0-5.0'	Grey silty clay, wet, no	odor
	5-1**	5.0-5.5'	Brown to rust clay with g	gravel, dry, no odor
25 2 S S S S S S S S S	5-4-6	5.5-9.0'	Same	
- 10- 55 5-1岁 · · · · · · · · · · · · · · · · · · ·	5-2	9.0-10.5'	Red brown silty clay with	tan grey and black
- 10- 555- 155	3-4-7		fine to medium gravel	
\$ S S S S S S S S S S S S S S S S S S S	5-3	10.5-14.0'	Same	
SS		14.0-15.5'	Red brown silty clay with	trace white to tan
2555	3-4-5		fine gravel and some rust	staining, dry no
20-555	5-4		odor	
55 · · · · · · · · · · · · · · · · · ·	4-6-7	15.5-19.0'	Same	
18,2,5-1,61,61		19.0-20.5'	Red brown silty clay with	tan and black gravel,
	5-5		dry no odor	
- F ₂ ;	4-6-7	20.5-24.0'	Same	
-30-153 51 =	5-6	24.0-25.5'	Red brown silty clay with	
			to medium sand, dry, no o	dor
+ 45541	5-5-6	25.5-29.0'	Same	
F 155'41:1	5-7	29.0-30.5'	Red brown silty clay with	shale fragments,
\(\frac{2}{5} \cdot \frac{2}{5} \cdot \frac{1}{5} \cdot \fr	5-9-12		slightly moist, no odor	
40-33	5-8	30.5-34.0'	Same	
	50.5	34.0-35.5'	Same, dense, slightly moi	st no odor
	5-9-12` 5-9	35.5-40.0'	Same, moist no odor	_
		40.0-40.2	Grey fine sand, saturated	
- 18351: - 18351: - 18351:	8-9-11	40.2-40.5	Red brown silty clay with	gravel, very moist,
L50 H'? 3 H''	5-10		no odor	

^{*} Blow Counts

2000 Bage 1 of 2 AR300083

^{**} Sample Numbers

49 to 28'

10 to G/L

Pellets 28 to 27'
Native 27 to 10'

Sand

Grout

Project Bally Eng. St	ructs	Owner	Allegheny Int.	Sketch Map
LocationBally, PA	,			
Well Number 86-3S	Tota	i Depth 47°	Diameter8"	
Surface Elevation	Wate	er Level; Initial	18.0' 24-hrs	•
Screen: Dia. 4"	Leng	gth30 *	Slot Size0.02"	
Casing: Dia. 4"	Leng	gth15 !	Type PVC Sch. 40	
Drilling Company CS Ga	rber	& Sons Drilling	Method <u>Air Hammer</u>	Notes
	Log	By F.D. Smi	th Date Drilled 4/12/86	
Depth (Feet) Graphic Log Well Construction	Sample Number		Description/Soil Classi (Color, Texture, Struc	
		0-0.5'	Brown top soil, moist, r	no odor
		0.5-7.0	Tan brown clay and rock	fragments (fill), dry
72 × 4 × 4 × 4 × 4 × 4 × 4 × 4 × 4 × 4 ×		7.0-10.0'	Brown clay with rock fra	agments, slightly moist,
10-55 5- 2 P.		12.0-20.0	Red brown clay with trac	ce shale, slightly
55 2			moist, no odor	
上 非经制制	.			
上 报334111111				
20-55		20.0-23.0'	Brown clay and weathered	d shale, fairly soft,
			wet, no odor	
		23.0-30.0'	- ·	weathered shale, slightly
+ 4			friable, wet, no odor	

30.0-47.0' Same, no odor

Bentonite 14.0 to 13.0'

Screen

Solid

Sand

Grout

45.0 to 15.0'

15.0 to G/L

45.0 to 14.0'

13.0 to G/L

6" Steel 5.0 to G/L 16" stick up

rate 5 to 10 gpm

303035 Page 1 of 1

Project Bally Eng. Structs. Owner Allegher	ny Int.	Sketch Map
Location_Bally, PA W.O. Number	431-02	
Well Number 86-3D Total Depth 147'	Diameter6"	
Surface ElevationWater Level: Initial 16.0 '	_24-hrs	
Screen: DiaLength	Slot Size	
Casing: Dia. 6 5/8" Length 97'	Type Carbon Steel	
Drilling CompanyC.S. Garber & Sons Drilling Method	Air hammer	Notes
Driller Brian Handslev Log By F.D. Smith	Date Drilled 4/10-4/11/	36
Ction	Description/Soil Class	hantan

Driller 2	Driller Brian Handslev Log By F.D. Smith Date Drilled 4/10-4/11/86					
Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)		
, 0 -				0'-0.5' Brown top soil		
	0.0			0.5-10.0' Brown clay and gravel (fill), dry no odor		
 -10 -	\$	3		10.0-20.0' Red brown clay with trace shale, dry		
 	5	∀ ∀		20.0-23.0' Brown weathered shale with some clay, wet, no odor		
		0		23.0-25.0' Red brown weathered shale (friable) with some clay,		
		0		wet, no odor 25.0-47.0' Red brown shale/fanglomerate		
-30 - 				Major water bearing zone at 39' rate: 5 to 10 gpm		
-40 		0		47.0-50.0' Red brown weathered shale with some dark gray		
 -50 -				shale, wet, no odor		

000000 Page 1 of 3

Project.	Project Bally Eng. Structs. Owner Allegheny Int.					
Locatio	n Ball	y, PA				
Well Nu	mber_8	6-3D				
Surface	Elevatio	n	Wa	16.0' 24-hrs		
					Slot Size	
_				_	Type Carbon Steel	Notes
_					ng Method <u>Air hammer</u>	
			ev Lo	g By F.D. S	<u>nith</u> Date Drilled 4/10-4/11/	86
Depth (Feet)	Graphic Log	Well Construction	Sample Number		Description/Soil Classii (Color, Texture, Struc	
-50 -				50.0-52.0'	Same, harder, wet, no odor	
	<u>-</u>	4		52.0-55.0	Same, fracture zone	
L 4		V		55.0-60.0'	Same, hard	
L 4	A-					
	0	V				
-60 -				60.0-70.0'	Red brown and dark gray sh	ale/fanglomerate,
F -	- <u></u>				increased water production	, no odor
		2			fractures at 67.0 to 70.0'	
		Y .				
70 -	5-			70.0-73.0	Same, more competent, frac	ture at 71'
┝╶┤				72 0 75 01		- 4-
}	E			/3.0-/5.0	Red brown and dark gray sha	ale/ianglomerate, no
F 1		7		75 0-00 01	odor	
}	F		'	75.0-90.0	Same, no odor fractures from 75.0 to 80.0	0.1
80 -	5				fractures from 75.0 to 80.0	0.
F -	F=				very hard at 87.0 to 88.0'	
1					very hard at 07.0 to 00.0	
F 1	F,					
t 1		. ÿ		90.0-97.0	Same, no odor, 6-8" quartz	ite framents
90	<u></u>	Y 5			returned	The Tragments
t 1		a b				
Γ 1				97.0-	Same, no odor	
[1	F-2-1			100.0	•	
100	[s_j					

Project Bally Eng. Stru	octs. Owner Alleghe	ny Int.	Sketch Map
Location Bally, PA			
Well Number 86-3D	Total Depth 147'	Diameter 6"	
Surface Elevation	Water Level: Initial 16.0'	24-hrs	
Screen: Dia	Length	Slot Size	
Casing: Dia. 6 5/8"	Length 97'	Type Carbon Steel	
Drilling CompanyC.S. Garbe	er & Sons Drilling Method	Air hammer	Notes
Driller Brian Handsley	Log By F.D. Smith	_Date Drilled 4/10-4/11/	86

Driller _	<u>srian</u>	Handsle	eyLo	g By F.D. Smit	h
Depth (Feet)	Graphic Log	Well	Sample Number		Description/Soil Classification (Color, Texture, Structures)
100	=			100.0-112.0'	Red brown and dark gray shale, hard, no odor
	 			112.0-115.0'	Dark gray shale, no odor
120				115.0-123.0'	Red brown shale, no odor
	 			123.0-147.0'	Same, no odor
130	 				rate at 147.0':50 gpm
L 4		\mathbf{H}			6" steel 97.0 to G/L
1	[]				grout 97.0 to 50.0'
					native fill 50.0 to G/L
140					
150					

Project.	Ball	y Eng.	Struct	SOwne	Alleqheny Int.	Sketch Map
•					Number 431-02	
Well Nu	mber_8	6-4	To:	al Depth 451	Diameter8"	
Surface	Elevatio	n	Wa	iter Level: Initial	10 * 24-hrs.	
Screen:	Dia	4"	Ler	ngth 30.0'	Slot Size 0.02"	
					TypePVC Schedule 40	
Drilling	Compan	yc.s.	Garber	& Sons Drillin	ng Method <u>Air hammer</u>	Notes
	aul W		Lo	By F.D. ST	nith Date Drilled 4/12/86	
Depth (Feet)	Graphic Log	Well Construction	Sample Number		Description/Soil Classil (Color, Texture, Struc	
- 0 -				0'-0.5'	Black top	
L "]	6 ⁴ 6.0	9 9		0.5-2.0'	Gray gravel (fill)	
	22,2	4 6		2.0-4.0'	Brown clay	
L]		2		4.0-20.0	Red brown and dark gray sh	ale slightly
L]	 		.		weathered, dry	
10 -						
L 1		i Ei			moist at 13.0 to 14.0'	
L]					wet at 15.0'	
L 4		: E :				
L 4	[]					
-20 -				20.0-30.0'	Red brown and dark gray sha	ale/fanglomerate,
┡ ┤	[-]				hard, no odor	
- 4						
-	[-0-]	<u>:</u> - :				
<u> </u>	 	: <u>=</u> :				
-30 -		<u> </u>		30.0-40.0'	Same, hard, no odor	
<u> </u>	[3-]					
	트래	· <u>=</u> .				
F 4	====	· . <u>=</u> · .				
F 4	<u> </u> -	=		40.0-45.0'	Same, hard, no odor	
40 -	-0-	ig = 0			rate at 45.0: 30 gpm	
┝╶┤		<u>: a::•</u>			screen 41.0 to 11.0	
├					solid 11.0 to G/L	
┝┈┪					sand 39.0 to 10.0'	
┡. ┪	F 4				bentonite 10.0 to 9.0'	
50 -	┝╶┤				grout 9.0 to G/L	
$ldsymbol{ldot}$					6" steel 8' to G/L	_

Project Bally Eng. Structs. Owner Alleghe	eny Int.	Sketch Map
Location_Bally, PA W.O. Number_	431-02	
Well Number 86-5S Total Depth 64*	_ Diameter8"	
Surface ElevationWater Level: Initial _42 *	24-hrs	
Screen: Dia. 4" Length 301	_ Slot Size	
Casing: Dia. 4" Length 34'	Type PVC Sch. 40	Nicke
Drilling Company C.S. Garber & Sons Drilling Method	Air hammer	Notes
Grea Hurtz Janes F.D. Smith	Data Dallad 4/28/86	-

Driller_	iller Grea Hurtz Lo			og By F.D. Smith Date Drilled 4/28/86
Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
- 0 -				0'-0.5' Brown top soil
	10.05	o. ģ		0.5-3.0' Light brown clay with gravel, moist, no odor
	2 2 2	<u>ا</u> ا		3.0-5.0' Tan and gray clay, slightly moist, no odor
	5 5 S			5.0-15.0' Brown clay with rock fragments, dry, no odor
	3 5 73 5 3 5 - 5 7 5 7 1 -	1		
	<u> </u>	, y		15.0-23.0' Red brown clay, dry, no odor, some rock
+ 4	7 2 7			fragments
 -20 -	5 5 5 5 5 7 - 5 5 - 2 5 5 2			
+ 4	25	: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		23.0-35.0' Dark red brown clay, dry, no odor, some rock
+ 4	777			fragments
+ 4	555			
-30 -	55 5 55 5 55 5			
+ +	555	╎┋╢		
+ +	55			35.0-47.0' Same, slightly moist, no odor trace of red
+ 1	5 5 5 5			shale fragments
40 -	2 2			
+ 1	55			
	- 5 5 -			47.0-50.0' Same, moist, no odor
F · 1	=======================================			III
1	3 5			
50	1 5 -	- =]··		
<u> </u>	لدت		L	d have a second of the second

Militaria de la companya de la compa		211111113
Project Bally Eng. Str	ucts. Owner Allegheny Int.	Sketch Map
Location Bally, PA	W.O. Number <u>431–02</u>	
Well Number 86-5S	Total Depth 64' Diameter 8"	
Surface Elevation	Water Level: Initial 42 24-hrs	
Screen: Dia. 4"	Length 30 Slot Size 20	
Casing: Dia. 4"	Length 34 Type PVC Sch. 40	Notes
Drilling CompanyS. Garber	& Sons Drilling Method Air hammer	140/63
	Log By F.D. Smith Date Drilled 4/28/86	
Depth (Feet) Graphic Log Well Construction Sample Number	Description/Soil Classi (Color, Texture, Struc	
-50	50.0-72.0' Red brown clay with shale no odor	fragments, very moist,

72.0'

Total depth

Screen

Solid 34 to G/L Sand 64 to 25' Bentonite 25 to 24' 24 to G/L Grout

64 to 34'

Project Bally Eng. St	ructs. Owner Alleghe	ny Int.	Sketch Map
Location Bally, PA	W.O. Number	431-02	
Well Number 86-5D	_Total Depth <u>165</u> '	Diameter 6"	
Surface Elevation	_Water Level: Initial 50 *	_24-hrs	
Screen: Dia	_Length	Slot Size	
Casing: Dia. 6 5/8"	_Length_112 *	Type Carbon Steel	Notes
Drilling CompanyC.S. Gar	ber & Sons Drilling Method	Air hammer	Notes
	· · ·	1 /05 /06	

_	Driller Greg Hurtz Log By F.D. Smith Date Drilled 4/25/86							
Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)				
_0 _				0'-0.5'	Brown top soil			
	138.82	Δ. Δ.		0.5-2.0'	Light brown clay and gravel, moist, no odor			
-	-\$ \$ - \$ \$ \$ - \$ \$	1.		2.0-5.0'	Tan and gray clay, slightly moist, no odor			
10	5			5.0-15.0'	Brown clay with rock fragments slightly moist			
	55 355			15.0-18.0'	Red brown clay with rock fragments slightly moist, no odor			
20	-555- -55-			18.0-23.0'	Same, moist, no odor			
	 - - 	0.0.0		23.0-30.0'	Same, moist, no odor			
30	555 555 55 557	Y Y Y Y		30.0-45.0'	Same with red brown shale fragments, moist			
·	3 S S -S S -	4. V.						
40 _	555 555	. A. C						
	25 5 -22 - -72	□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□<			Same with shale fragments very moist, no odor			
50	25 S 25 S 25 S 25 S	Y .		47.0-50.0'	Same, wet at 50'			

Project Bally Eng. Structs. Owner Allegher	ny Int.	Sketch Map
Location_Bally, PA W.O. Number	431-02	
Well Number 86-5D Total Depth 165'	Diameter 6"	·
Surface ElevationWater Level: Initial 50 *	_24-hrs	
Screen: DiaLength	Slot Size	
Casing: Dia. 6 5/8" Length 112'	Type Carbon Steel	
Drilling CompanyC.S. Garber & Sons Drilling Method	Air hammer	Notes
Driller Grea Hurtz Log By F.D. Smith	Date Drilled4/25/86	
8 8		

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
-50 -	<u> </u>	₹ ¥.		50.0-65.0' Same, wet, no odor
	5 5 5 5 5 5	Z . Z . Z . Z . Z . Z . Z . Z . Z . Z .		
_60 _ 	35 255 355	· · · · · · · · · · · · · · · · · · ·		
	 3	Y X D		65.0-73.0' Same, wet, no odor
-70 - 	355 -55- 555	N. D. D		73.0-85.0' Same, wet, no odor, slightly harder
	2 2 7 2 2 2 2 2 2 2 3 2			
80 -	2 2 7 2 2 2 2 2 2 2 2 2	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		85.0-98.0' Red brown clay and weathered red brown shale, wet,
	 5	Z		no ∞dor
90 -	5 S -	Δ		
- - -	5 5 5 5 ====	A A		98.0- Red brown shale/fanglomerate hard, wet, no odor 100.0'
100-		."		

200053

Page 2 of 4

Project Bally Eng. Struc	ts. Owner Allegheny Int.	Sketch Map
Location Rally, PA	W.O. Number431-02	
Well Number 86-5D To	otal Depth 165! Diameter 6"	
Surface Elevation Wa	ater Level: Initial 50 24-hrs.	
Screen: DiaLe	ngthSlot Size	
Casing: Dia. 6 5/8" Le	ength 112' Type Carbon Steel	Notes
Drilling CompanyC.S. Garber	& SONS Drilling Method Air hammer	110163
	og By F.D. Smith Date Drilled 4/25/86	
Depth (Fect) Graphic Log Well Construction Sample Number	Description/Soil Classi (Color, Texture, Struc	
100	100-110.0' Same, water production 5 g	s than 1 gpm, no odor
130	134.0- Same, water production 3-4 150.0' Fracture at 150'	gpm at 147', no odor

Sketch Map

Project_	Ball	y Eng.	Struc	ts. Owner Allegheny Int. Sketch Map	•
				W.O. Number 431-02	
				tal Depth 165' Diameter 6"	
Surface	Elevation	n	Wa	ater Level; Initial 50 * 24-hrs	
Screen:	Dia		Ler	ngthSlot Size	
				ngth_112' Type_Carbon_Steel Notes	
-				& Sons Drilling Method Air harmer	
			Lo	g By F.D. Smith Date Drilled 4/25/86	
Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)	NATURE OF THE PROPERTY OF THE
150_				150-158.0' Same, major water bearing zone at 159' -	estimated
<u> </u>				50-60 gpm, no odor	
				158-165.0' Same, no odor	
160		┝╼┻╼┶┥			
[1					
$\begin{bmatrix} 1 \end{bmatrix}$				Total Depth 165'	
				Rate at 165': 60+ gpm	
<u> </u>	[]			·	
170	L 4				
 	<u> </u>				
+ 4					
	├ ┤			6" steel 112 to G/L	
-100	┝╶╢			grout 112 to 25'	
180	 			native fill 25 to 4' grout 4 to G/L	
+ +	F -			1 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
† †	<u> </u>			·	
† †	r 1				
190	r 1				
r 1	1				
[1	[1				
$[\]$	[]				
	L]				
200	L]				

Project Bally Eng. Structs.	OwnerAllegheny Int.	Sketch Map
Location Bally, PA	_ W.O. Number431-02	
Well Number TB-1 Total Depth	26¹ Diameter 6"	
Surface Elevation Water Level	: Initial24-hrs	
Screen: DiaLength	Slot Size	
Casing: DiaLength	Туре	Notes
Drilling CompanyValton Corp.	Drilling Method HSA	Notes
Dellar Paul Folev Los By Fa	D. Smith Data Data 5/1/86	1

Well Construction Description/Soil Classification Sample Number (Color, Texture, Structures) Brown clay with trace black gravel (fill), moist, b.0-2.0' 0 70.0 2-3-3-4 no odor #1 2.0-4.0' Same, moist, no odor 4-6-4-7 Brown to gray clay with gravel (granite) and iron 4.0-6.0' #2 staining, slightly moist, no odor 3-4-6-13. 6.0-8.0' Light brown clay with gravel (granite) slightly #3 moist, no odor 8-7-10-13 8.0-10.0' Light brown clay with gravel (milky quartz, #4 angular), slightly moist, no odor 6-6-13-17 10.0-11.0' Same #5 -10 11.0-14.0' Red brown clay (dense), slightly moist 14.0-16.0' Red brown clay with red brown shale fragments and 5-6-8-9 tan quartzite fragments, slightly moist, no odor 15 16.0-19.0' Same, moist, no odor #6 ₄ 19.0-21.0' Same with some red shale and tan quartzite 2-5-6-7 fragments, slightly moist, no odor 21.0-24.0' Same, slightly moist, no odor #7 24.0-26.0' Red brown clay with red brown shale fragments and 3-5-7-9 tan to rust quartzite fragments, slightly moist, no ∞dor

Sketch Map

Project Bally Eng. Struct	Sketch Map	
Location Bally, PA		
Well Number TB-2 Total	al Depth 5.5" Diameter 6"	
Surface ElevationWat	ter Level: Initial 4.3 24-hrs.	
Screen: DiaLen	gthSlot Size	
	gthType	Notes
-	D- Drilling Method HSA	1
Driller Paul Foley Log	By F.D. Smith Date Drilled 5/2/86	
Depth (Feet) Graphic Log Well Construction Sample Number	Description، Soil Classi (Color, Texture, Struc	
	0.0-0.5' Brown clay with trace grav	vel, moist, no cdor
F -1F5's'-1	0.5-2.0' Same	
5 5 5- 4-16-28	2.0-4.0' Brown clay with gravel (gr	anite) moist, no odor
[][s's] # ² .	4.0-5.0' Brown clay, saturated, no	∞dor
5 5 5 37-30 <u>-50</u>	5.0-5.5' Brown silty sand with trac	
55 #3	saturated, no ∞dor	
+ + +		
+ + +	Auger refusal at 5.5'	
-10		
F + H		
F #F #		
t_		
20		
<u> </u>		
1 1 1 1		
F 4F 4		
F 4F 41 11 11		
-25		

Project_Bal	lv Enq.	Struct	CSOwne	r_Alleo	heny Int	-1	Sketch Map
Location_Bal	ly, PA		W.O. I	Number	<u>431–</u> 0)2	
Well Number_	TB-3	To	tal Depth 11.	75 '	Diametei	r6"	
Surface Elevat	ion	Wa	iter Level: Initial	9.3'	24-hrs		
Screen: Dia		Ler	ngth	<i>y</i>	Slot Size		
Casing: Dia		Ler	ngth	, ,,,,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Туре		Notes
			Drilli	_			
	7	Lo	g By F.D.	Smith	Date Oril	lled <u>5/2/86</u>	
Depth (Feet) Graphic Log	Well	Sample Number				ription/Soil Classi blor, Texture, Struc	
0-555		2-4-4-3 * #1	0.0-1.0'	Brown Same	clay, mo	oist, no odor	(1' recovery)
1555 1555		2-4-7-4 #2	2.0-3.0'		clay wit	h gravel, mo	ist, no odor (1'recovery)
		{	3.0-4.0' 4.0-6.0'	Same Brown	clay wit	h gravel and	some sand, moist, no
5-15,5		#3		∞dor			
3.5.5 5.5.5		9-20-40-25 #4	0 0 10 01	T 1			
		5-7-8-10	8.0-10.0	odor odor	prown ci	ay with some.	gravel, moist, no
10 55		#5	10.0-11.5'	Same,	moist, n	o ∞dor	
25		50/0.25 #6	11.5-11.75	'Same,	moist, n	o odor	
			Auger refu	sal at	11.75'		
-15			Water at b	ottom c	of boring	ı	
┝╶╂	-						
├	+				•		
- -	-						
┝╶╂	1						
-20-1	1						
h	1						
┝┄╌┩	1 -						
 	1						
<u> </u>	1						
-25 -	1						
	<u> </u>	<u> </u>	L				

Project Bally Eng. Structs.	Owner Allegheny Int.	Sketch Map
Location Bally, PA	.W.O. Number 431-02	
Well Number TB-4 Total Depth.	4.7' Diameter 6"	
Surface Elevation Water Level:	Initial24-hrs	
Screen: DiaLength	Slot Size	,]
Casing: DiaLength	Type	Notes
Drilling Company Walton Corp.	_Drilling MethodHSA	Notes
Driller Paul Foley Log By	F.D. Smith Date Drilled 5/2/86	

Driller	Paul	Foley	Lo	g By F.D. Smith Date Drilled 5/2/86
Depth (Feet)	Graphic Log	Well	Sample Number	Description/Soil Classification (Color, Texture, Structures)
- 0-	Graph	Well	gwnN 2-3-17-5 #1 4-14-16 #2 10 -50/2 #3	0.0-1.0' Brown clay with gravel (granite), moist, no cdor 1.0-2.0' Same, slightly moist, no cdor 2.0-3.5' Brown sandy clay with gravel (granite) 3.5-4.0' Same, slightly moist, no cdor 4.0-4.7' Same, slightly moist, no cdor Auger refusal at 4.7'
				·
]			

* Blow Counts

) 3039 Page 1_of 1_

Project Bally Eng. Structs. Owner Allegheny Int.	Sketch Map
Location_Bally, PA W.O. Number 431-02	
Well Number TB-5 Total Depth 2.5' Diameter 6"	
Surface Elevation Water Level: Initial 24-hrs	
Screen: DiaSlot Size	
Casing: DiaType	Notes
Drilling Company Walton Corp. Drilling Method HSA	ivotes
Driller Paul Foley Log By F.D, Smith Date Drilled 5/2/86	

Paul Poley Cog By F.D. Smith Date Drilled 5/2/96	Drilling	Compar	y Walt	on Cor	D. Dri	Iling Method	HSA	indies
Description/Soil Classification (Color. Texture. Structures) 0.0-0.5' Brown clay, moist, no odor 0.5-2.0' Brown clay with gravel (granite) 2.0-2.9' Gray silty clay with rust stains and tan to brown rock fragments (granite), moist, no odor Auger refusal at 2.5'	Driller_	Paul	Folev	Lo	g By F.D.	Smith o	ate Drilled <u>5/2/86</u>	
0.0-0.5' Brown clay, moist, no odor 0.5-2.0' Brown clay with gravel (granite) 2.0-2.9' Gray silty clay with rust stains and tan to brown rock fragments (granite), moist, no odor Auger refusal at 2.5'	Depth (Feet)	Graphic Log	Well				Description/Soil Class	ification ctures)
1 11 U	- 10	-55 - -55 - -55 - 		1 1	0.5-2.0' 2.0-2.9'	Brown clay Gray silty brown rock	y with gravel (gr y clay with rust k fragments (gra	ranite) stains and tan to

* Blow Counts

Page 1 of 1

Appendix B

Laboratory Analysis Sheets:
Soil Samples
On-Site Wells
Off-Site Wells
Chain-of-Custody Records

2004⁰¹ AR300101



Cancaster Laboratories.

2425 NEW HOLLAND PIKE LANCASTER PA 1760

ATL Sample No SV 1067723

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Eng. Structures TB-1 (10') Grab Soil Sample Collected on 05/01/86 (1500) by FDS Date Reported 5/13/86
Date Submitted 5/ 6/86
Discard Date 6/13/86
Collected by C
P.O. 43102
Rel.

RESULT		LIMIT OF		
Purgeable Aromatics M#602	AS RECEIVED		DETECTION	LAB CODE
Benzene	N.D.	ppb	- 20.	070300000N
Toluene	N.D.	ppb	20.	070400000N
Chlorobenzene	N.D.	ppb	20.	070500000N
Ethylbenzene	N.D.	ppb	20.	070600000N

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

203168



Lancaster Laboratories

2425 NEW HOLLAND PIKE LANCASTER PA 1760

MATESAMPLE NOSSY 1067723

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Eng. Structures TB-1 (10') Grab Soil Sample Collected on 05/01/86 (1500) by FDS Date Reported 5/13/86
Date Submitted 5/6/86
Discard Date 6/13/86
Collected by C
P.O. 43102
Rel.

Bromomethane N.D. ppb 100. 0712000000 2-Chloroethylvinyl ether N.D. ppb 200. 0713000001 Vinyl chloride N.D. ppb 20. 0714000001 Chloroethane N.D. ppb 20. 0715000001 Methylene chloride N.D. ppb 20. 0716000001 1,1-Dichloroethene N.D. ppb 20. 0717000001 1,1-Dichloroethane N.D. ppb 20. 0718000001 trans-1,2-Dichloroethene N.D. ppb 20. 0720000001 Chloroform N.D. ppb 20. 0721000001 1,1-Trichloroethane N.D. ppb 20. 0721000001 1,1,1-Trichloroethane N.D. ppb 20. 0722000000 Dichlorobromomethane N.D. ppb 20. 0724000001 1,2-Dichloropropene N.D. ppb 20. 0725000001 trans-1,3-Dichloropropene N.D. ppb 20. 07280000		RESULT		LIMIT OF	•
Bromomethane N.D. ppb 100. 0712000000 2-Chloroethylvinyl ether N.D. ppb 200. 0713000001 Vinyl chloride N.D. ppb 20. 0714000001 Chloroethane N.D. ppb 20. 0715000001 Methylene chloride N.D. ppb 20. 0716000001 1,1-Dichloroethene N.D. ppb 20. 0717000001 1,1-Dichloroethane N.D. ppb 20. 0718000001 trans-1,2-Dichloroethene N.D. ppb 20. 0720000001 Chloroform N.D. ppb 20. 0721000001 1,1-Trichloroethane N.D. ppb 20. 0721000001 1,1,1-Trichloroethane N.D. ppb 20. 0722000000 Dichlorobromomethane N.D. ppb 20. 0724000001 1,2-Dichloropropene N.D. ppb 20. 0725000001 trans-1,3-Dichloropropene N.D. ppb 20. 07280000	Purgeable Halocarbons M601	AS RECEI	VED	DETECTION	LAB CODE
Bromomethane N.D. ppb 100. 071200000000000000000000000000000000000	Chloromethane	N.D.	ppb	100.	071100000N
Vinyl chloride N.D. ppb 20. 0714000000 Chloroethane N.D. ppb 20. 0715000000 Methylene chloride N.D. ppb 20. 0716000000 1,1-Dichloroethene N.D. ppb 20. 0718000000 1,1-Dichloroethane N.D. ppb 20. 0718000000 trans-1,2-Dichloroethene N.D. ppb 20. 0720000000 1,2-Dichloroethane N.D. ppb 20. 0721000000 1,1,1-Trichloroethane N.D. ppb 20. 0722000000 Carbon tetrachloride N.D. ppb 20. 0722000000 Dichlorobromomethane N.D. ppb 20. 0724000000 1,2-Dichloropropane N.D. ppb 20. 0725000000 trans-1,3-Dichloropropene N.D. ppb 20. 0726000000 Trichloroethene N.D. ppb 20. 0727000000 Dibromochloromethane N.D. ppb 20. 07	Bromomethane	N.D.		100.	071200000N
Vinyl chloride N.D. ppb 20. 071400000000000000000000000000000000000	2-Chloroethylvinyl ether	N.D.	ppb	200.	071300000N
Methylene chloride N.D. ppb 20. 0716000000 1,1-Dichloroethene N.D. ppb 20. 0717000000 1,1-Dichloroethane N.D. ppb 20. 0718000000 trans-1,2-Dichloroethene N.D. ppb 20. 0720000000 Chloroform N.D. ppb 20. 072000000 1,2-Dichloroethane N.D. ppb 20. 0721000000 1,1,1-Trichloroethane N.D. ppb 20. 0722000000 Carbon tetrachloride N.D. ppb 20. 0723000000 Dichlorobromomethane N.D. ppb 20. 0724000000 1,2-Dichloropropane N.D. ppb 20. 0725000000 trans-1,3-Dichloropropene N.D. ppb 20. 0726000000 Trichloroethene N.D. ppb 20. 0727000000 Dibromochloromethane N.D. ppb 20. 0728000000 1,1,2-Trichloroethane N.D. ppb 20. <t< td=""><td>Vinyl chloride</td><td>N.D.</td><td>ppb</td><td>20.</td><td>071400000N</td></t<>	Vinyl chloride	N.D.	ppb	20.	071400000N
1,1-Dichloroethene N.D. ppb 20. 07170000001 1,1-Dichloroethane N.D. ppb 20. 0718000000 trans-1,2-Dichloroethene N.D. ppb 20. 0720000000 Chloroform N.D. ppb 20. 0720000000 1,2-Dichloroethane N.D. ppb 20. 0721000000 1,1,1-Trichloroethane N.D. ppb 20. 0722000000 Carbon tetrachloride N.D. ppb 20. 0723000000 Dichlorobromomethane N.D. ppb 20. 0724000000 1,2-Dichloropropane N.D. ppb 20. 0725000000 trans-1,3-Dichloropropene N.D. ppb 20. 0726000000 Trichloroethene N.D. ppb 20. 0728000000 1,1,2-Trichloroethane N.D. ppb 20. 0729000000 cis-1,3-Dichloropropene N.D. ppb 20. 0730000000 Bromoform N.D. ppb 40. 0731000000 1,1,2,2-Tetrachloroethane N.D. ppb 40. <td>Chloroethane</td> <td>N.D.</td> <td>ppb</td> <td>20.</td> <td>071500000N</td>	Chloroethane	N.D.	ppb	20.	071500000N
1,1-Dichloroethane N.D. ppb 20. 071800000000000000000000000000000000000	Methylene chloride	N.D.	ppb	20.	071600000N
trans-1,2-Dichloroethene N.D. ppb 20. 071900000000000000000000000000000000000		N.D.	ppb		071700000N
Chloroform N.D. ppb 20. 07200000000000000000000000000000000000		N.D.	ppb		071800000N
1,2-Dichloroethane N.D. ppb 20. 0721000001 1,1,1-Trichloroethane N.D. ppb 20. 0722000001 Carbon tetrachloride N.D. ppb 20. 0723000001 Dichlorobromomethane N.D. ppb 20. 0724000001 1,2-Dichloropropane N.D. ppb 20. 0725000001 trans-1,3-Dichloropropene N.D. ppb 20. 0726000001 Trichloroethene N.D. ppb 20. 0727000001 Dibromochloromethane N.D. ppb 20. 0728000001 1,1,2-Trichloroethane N.D. ppb 20. 0730000001 Bromoform N.D. ppb 40. 0731000001 1,1,2,2-Tetrachloroethane N.D. ppb 40. 0732000001	trans-1,2-Dichloroethene	N.D.	ppb´	20.	071900000N
1,1,1-Trichloroethane N.D. ppb 20. 0722000000 Carbon tetrachloride N.D. ppb 20. 0723000000 Dichlorobromomethane N.D. ppb 20. 0724000000 1,2-Dichloropropane N.D. ppb 20. 0725000000 trans-1,3-Dichloropropene N.D. ppb 20. 0726000000 Trichloroethene N.D. ppb 20. 0727000000 Dibromochloromethane N.D. ppb 20. 0728000000 1,1,2-Trichloroethane N.D. ppb 20. 0730000000 Bromoform N.D. ppb 40. 0731000000 1,1,2,2-Tetrachloroethane N.D. ppb 40. 0732000000	Chloroform	N.D.	ppb	20.	072000000N
Carbon tetrachloride N.D. ppb 20. 0723000000 Dichlorobromomethane N.D. ppb 20. 072400000 1,2-Dichloropropane N.D. ppb 20. 072500000 trans-1,3-Dichloropropene N.D. ppb 20. 072600000 Trichloroethene N.D. ppb 20. 072700000 Dibromochloromethane N.D. ppb 20. 072800000 1,1,2-Trichloroethane N.D. ppb 20. 073000000 cis-1,3-Dichloropropene N.D. ppb 20. 073000000 Bromoform N.D. ppb 40. 073100000 1,1,2,2-Tetrachloroethane N.D. ppb 40. 0732000000	1,2-Dichloroethane	N.D.	ppb		072100000N
Dichlorobromomethane N.D. ppb 20. 0724000000 1,2-Dichloropropane N.D. ppb 20. 0725000000 trans-1,3-Dichloropropene N.D. ppb 20. 0726000000 Trichloroethene N.D. ppb 20. 0727000000 Dibromochloromethane N.D. ppb 20. 0728000000 1,1,2-Trichloroethane N.D. ppb 20. 0730000000 cis-1,3-Dichloropropene N.D. ppb 20. 0730000000 Bromoform N.D. ppb 40. 0731000000 1,1,2,2-Tetrachloroethane N.D. ppb 40. 07320000000			ppb		072200000N
1,2-Dichloropropane N.D. ppb 20. 072500000000000000000000000000000000000	Carbon tetrachloride	N.D.	ppb		072300000N
trans-1,3-Dichloropropene N.J. ppb 20. 0726000000 Trichloroethene N.D. ppb 20. 072700000 Dibromochloromethane N.D. ppb 20. 0728000000 1,1,2-Trichloroethane N.D. ppb 20. 0729000000 cis-1,3-Dichloropropene N.D. ppb 20. 0730000000 Bromoform N.D. ppb 40. 0731000000 1,1,2,2-Tetrachloroethane N.D. ppb 40. 0732000000		N.D.	ppb		072400000N
Trichloroethene N.D. ppb 20. 0727000001 Dibromochloromethane N.D. ppb 20. 0728000001 1,1,2-Trichloroethane N.D. ppb 20. 0729000001 cis-1,3-Dichloropropene N.D. ppb 20. 0730000001 Bromoform N.D. ppb 40. 0731000001 1,1,2,2-Tetrachloroethane N.D. ppb 40. 0732000001		N.D.	ppb		072500000N
Dibromochloromethane N.D. ppb 20. 0728000000 1,1,2-Trichloroethane N.D. ppb 20. 072900000 cis-1,3-Dichloropropene N.D. ppb 20. 073000000 Bromoform N.D. ppb 40. 073100000 1,1,2,2-Tetrachloroethane N.D. ppb 40. 0732000000	trans-1,3-Dichloropropene	N.J.	ppb		072600000N
1,1,2-Trichloroethane N.D. ppb 20. 0729000000 cis-1,3-Dichloropropene N.D. ppb 20. 073000000 Bromoform N.D. ppb 40. 073100000 1,1,2,2-Tetrachloroethane N.D. ppb 40. 0732000000		N.D.	ppb		072700000N
cis-1,3-Dichloropropene N.D. ppb 20. 07300000000000000000000000000000000000	Dibromochloromethane	N.D.	ppb		072800000N
Bromoform N.D. ppb 40. 0731000000 1,1,2,2-Tetrachloroethane N.D. ppb 40. 0732000000		N.D. '	ppb		072900000N
1,1,2,2-Tetrachloroethane N.D. ppb 40. 073200000	cis-1,3-Dichloropropene	N.D.			
		N.D.			073100000N
m . 13 ./ ^^ ^30000000					
Tetrachloroethene N.D. ppb 20. 0/3300000	Tetrachloroethene	N.D.	ppb	20.	073300000N

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation Chemical & Biological fields of testing



SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

000403



Cancaster Caboratories

2425 NEW HOLLAND PIKE, LANCASTER, PÅ 17601

MILESample No SV 1067724

Environ. Resources Management
999 West Chester Pike
P. O. Box 357
West Chester, PA 19380
Bally Eng. Structures TB-1 (15') Grab Soil Sample
Collected on 05/01/86 (1500) by FDS

Date Reported 5/13/86
Date Submitted 5/6/86
Discard Date 6/13/86
Collected by C
P.O. 43102
Rel.

RESULT		r	LIMIT OF		
Purgeable Aromatics M#602	AS RECEIVED		DETECTION	LAB CODE	
Benzene	N.D.	ppb	20.	070300000N	
Toluene	N.D.	ppb	20.	070400000N	
Chlorobenzene	N.D.	ppb	20.	070500000N	
Ethylbenzene	N.D.	ppb	20.	070600000N	

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

ember American Council of Sidebendent Laboratories, Inc.

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

200104



77 17) 656-2301 Perfection of the control of the co

Environ. Resources Management 999 West Chester Pike P. O. Box 357

West Chester, PA 19380 Bally Eng. Structures TB-1 (15') Grab Soil Sample

Collected on 05/01/86 (1500) by FDS

Date Reported 5/13/86 Date Submitted 5/ 6/86 Discard Date 6/13/86 Collected by C P.O. 43102

Rel.

	RESULT		LIMIT OF	
Purgeable Halocarbons M601	AS RECEI	AS RECEIVED		LAB CODE
Chloromethane	N.D.	ppb	100.	071100000N
Bromomethane	N.D.	ppb	100.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	200.	071300000N
Vinyl chloride	N.D.	ppb	20.	071400000N
Chloroethane	N.D.	ppb	20.	071500000N
Methylene chloride	N.D.	ppb	20.	071600000N
1,1-Dichloroethene	N.D.	ppb	20.	071700000N
1,1.Dichloroethane	N.D.	ppb	20.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	20.	071900000N
Chloroform	N.D.	ppb	20.	072000000N
1,2-Dichloroethane	N.D.	ppb	20.	072100000N
1,1,1-Trichloroethane	N.D.	ppb	20.	072200000N
Carbon tetrachloride	N.D.	ppb	20.	072300000N
Dichlorobromomethane	N.D.	ppb	20.	072400000N
1,2-Dichloropropane	N.D.	ppb	20.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	20.	072600000N
Trichloroethene	N.D.	ppb	20.	072700000N
Dibromochloromethane	N.D.	ppb	20.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	20.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	20.	073000000N
Bromoform	N.D.	ppb	40.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	40.	073200000N
Tetrachloroethene	N.D.	ppb	20.	073300000N

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation
Chemical & Biological fields of testing



SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis



Cancaster Laboratories

2425 NEW HOLLAND PIKE, LANCASTER, PA 1760

60 A 60 M C12 p 656 230 M C 1974 A 19 M

THIS SAMPLE TO STUDIO STUDIO

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Eng. Structures TB-1 (26') Grab Soil Sample Collected on 05/01/86 (1500) by FDS Date Reported 5/13/86
Date Submitted 5/ 6/86
Discard Date 6/13/86
Collected by C
P.O. 43102
Rel.

	RESULT		LIMIT OF		
Purgeable Aromatics M#602	AS RECEIV	ED	DETECTION	LAB CODE	
Benzene	N.D.	ppb	20.	070300000N	
Toluene	N.D.	ppb	20.	070400000N	
Chlorobenzene	N.D.	ppb	20.	070500000N	
Ethylbenzene	N.D.	ppb	20.	070600000N	

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

imber American Council of lependent Laboratories, Inc.

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis



Lancaster Laboratories

2425 NEW HOLLAND PIKE, LANCASTER, PA 17601

LLI Sample No. SV 1067725

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Eng. Structures TB-1 (26') Grab Soil Sample Collected on 05/01/86 (1500) by FDS Date Reported 5/13/86
Date Submitted 5/ 6/86
Discard Date 6/13/86
Collected by C
P.O. 43102
Rel.

TTUTE OF

	RESULT		LIMIT OF	
Purgeable Halocarbons M601	AS RECE	IVED	DETECTION	LAB CODE
Chloromethane	N.D.	ppb	100.	071100000N
Bromomethane	N.D.	ppb	100.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	200.	071300000N
Vinyl chloride	N.D.	ppb	20.	071400000N
Chloroethane	N.D.	ppb	20.	071500000N
Methylene chloride	N.D.	ppb	20.	071600000N
1,1-Dichloroethene	N.D.	ppb	20.	071700000N
1,1-Dichloroethane	N.D.	ppb	20.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	20.	0,71900000N
Chloroform	N.D.	ppb	20.	072000000N
1,2-Dichloroethane	N.D.	ppb	20.	072100000N
1,1,1-Trichloroethane	N.D.	ppb	20.	072200000N
Carbon tetrachloride	N.D.	ppb	20.	072300000N
Dichlorobromomethane	N.D.	ppb	20.	072400000N
1,2-Dichloropropane	N.D.	ppb	20.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	20.	072600000N
Trichloroethene	N.D.	ppb	20.	072700000N
Dibromochloromethane	N.D.	ppb	20.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	20.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	20.	073000000N
Bromoform	N.D.	ppb	40.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	40.	073200000N
Tetrachloroethene	N.D.	ppb	20.	073300000N

DECLIE OF

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation Chemical & Biological fields of testing



SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

000464



Cancaster Laboratories

2425 NEW HOLLAND PIKE LANCASTER PA 17601

aliei sample No SV 1067922

Environ. Resources Management
999 West Chester Pike
P. O. Box 357
West Chester, PA 19380
Bally Eng. Structures TB-3 (8.0') Grab Soil Sample
Collected on 05/02/86 (1030) by FDS

Date Reported 5/13/86
Date Submitted 5/ 6/86
Discard Date 6/13/86
Collected by C
P.O. 43102
Rel.

	RESULT		LIMIT OF		
Purgeable Aromatics M#602	AS RECEIVED		DETECTION	LAB CODE	
Benzene	N.D.	ppb	20.	070300000N	
Toluene	N.D.	ppb	20.	070400000N	
Chlorobenzene	N.D.	ppb	20.	070500000N	
Ethylbenzene	N.D.	ppb	20.	070600000N	

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

nber: American Council of spendent Laboratories, Inc.

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

203368



2425 NEW HOLLAND PIKE, LANCASTER. PA 17601

MAI Sample:No SV 1067722

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Eng. Structures TB-3 (8.0') Grab Soil Sample Collected on 05/02/86 (1030) by FDS Date Reported 5/13/86
Date Submitted 5/ 6/86
Discard Date 6/13/86
Collected by C
P.O. 43102
Rel.

	RESULT		LIMIT OF		
Purgeable Halocarbons M601	AS RECEIVED		DETECTION	LAB CODE	
Chloromethane	N.D.	ppb	100.	071100000N	
Bromomethane	N.D.	ppb	100.	071200000N	
2-Chloroethylvinyl ether	N.D.	ppb	200.	071300000N	
Vinyl chloride	N.D.	ppb	20.	071400000N	
Chloroethane	N.D.	ppb	20.	071500000N	
Methylene chloride	N.D.	ppb	20.	071600000N	
l,1-Dichloroethene	N.D.	ppb	20.	071700000N	
1,1-Dichloroethane	N.D.	ppb	20.	071800000N	
trans-1,2-Dichloroethene	N.D.	ppb	20.	071900000N	
Chloroform	N.D.	ppb	20.	072000000N	
1,2-Dichloroethane	N.D.	ppb	20.	072100000N	
l,1,1-Trichloroethane	N.D.	ppb	20.	072200000N	
Carbon tetrachloride	N.D.	ppb	20.	072300000N	
Dichlorobromomethane	N.D.	ppb	20.	072400000N	
1,2-Dichloropropane	N.D.	ppb	20.	072500000N	
t ans-1,3-Dichloropropene	N.D.	ppb	20.	072600000N	
Trichloroethene	N.D.	ppb	20.	072700000N	
Dibromochloromethane	N.D.	ppb	20.	072800000N	
1,1,2-Trichloroethane	N.D.	ppb	20.	072900000N	
cis-1,3-Dichloropropene	N.D.	ppb	20.	073000000N	
Bromoform	N.D.	ppb	40.	073100000N	
1,1,2,2.Tetrachloroethane	N.D.	ppb	40.	073200000N	
Tetrachloroethene	N.D.	. ppb	20.	073300000N	

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye



mber American Council of spendent Laboratories, Inc.

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis



Hil-Sample No. SV-1067721

Environ. Resources Management

999 West Chester Pike

P. O. Box 357

West Chester, PA 19380

Bally Eng. Structures TB-4 (4.7') Grab Soil Sample

Collected on 05/02/86 (1000) by FDS

Date Reported 5/13/86 Date Submitted 5/ 6/86 Discard Date 6/13/86

Collected by C

P.O. 43102

Rel.

	RESULT	•	LIMIT OF	
Purgeable Aromatics M#602	AS RECEIVED		DETECTION	LAB CODE
Benzene	N.D.	ppb	20.	070300000N
Toluene	20.	ppb	20.	070400000N
Chlorobenzene	N.D.	ppb	20.	070500000
Ethylbenzene	N.D.	ppb	20.	070600000

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation rical & Biological fields of testing

nber: American Council of pendent Laboratories, Inc.

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis



INCORPORATED.
NEW HOLLAND PIKE, LANCASTER. PA

Mal sample No - Syn 10677/21

77171,656-2301 Environ. Resources Management 999 West Chester Pike P. O. Box 357

19380 West Chester, PA

Bally Eng. Structures TB-4 (4.7') Grab Soil Sample

Collected on 05/02/86 (1000) by FDS

Date Reported 5/13/86 Date Submitted 5/ 6/86 Discard Date 6/13/86 Collected by C P.O. 43102

Rel.

	RESULT		LIMIT OF	
Purgeable Halocarbons M601	AS RECEIVED		DETECTION	LAB CODE
Chloromethane	N.D.	ppb	100.	071100000N
Bromomethane	N.D.	ppb	100.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	200.	071300000
Vinyl chloride	N.D.	ppb	20.	071400000
Chloroethane	N.D.	ppb	20.	071500000
Methylene chloride	30.	ppb	20.	071600000
1,1-Dichloroethene	N.D.	ppb	20.	071700000
1,1-Dichloroethane	N.D.	ppb	20.	071800000
trans-1,2-Dichloroethene	N.D.	ppb	20.	071900000
Chloroform	N.D.	ppb	20.	072000000
1,2-Dichloroethane	N.D.	ppb	20.	072100000
1,1,1-Trichloroethane	N.D.	ppb	20.	072200000
Carbon tetrachloride	N.D.	ppb	20.	072300000
Dichlorobromomethane	N.D.	ppb	20.	072400000
1,2-Dichloropropane	N.D.	ppb	20.	072500000
trans-1,3-Dichloropropene	N.D.	ppb	20.	072600000
Trichloroethene	N.D.	ppb	20.	072700000
Dibromochloromethane	N.D.	ppb	20.	072800000
1,1,2-Trichloroethane	N.D.	ppb	20.	072900000
cis-1,3-Dichloropropene	N.D.	ppb	20.	073000000
Bromoform	N.D.	ppb	40.	073100000
1,1,2,2-Tetrachloroethane	N.D.	ppb	40.	073200000
Tetrachloroethene	N.D.	ppb	20.	073300000

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for _aboratory Accreditation Chemical & Biological fields of testing

> SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis



2425 NEW HOLLAND PIKE LANCASTER PA 17601

Part Sample No. 177, 1069484

6/ 4/86

5/13/86

6/12/86

Date Reported

Date Submitted

LIMIT OF

Environ. Resources Management
999 West Chester Pike
P. O. Box 357
West Chester, PA 19380
ally Eng. Structures MW86-1 4" PVC We

Discard Date
Collected by C
P.O.

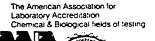
West Chester, PA 19380 Coll
Bally Eng. Structures MW86-1 4" PVC Well Grab P.O.
Collected on 05/12/86 (1230) by FDS & TDM Rel.

Volatiles in Groundwater AS RECEIVED DETECTION LAB CODE Benzene N.D. 1. 070300000N ppb Toluene N.D. ppb 1. 070400000N Chlorobenzene N.D. ppb 1. 070500000N Ethylbenzene 1. N.D. 070600000N ppb Chloromethane N.D. 5. 071100000N ppb Bromomethane N.D. 5. 071200000N ppb 2-Chloroethylvinyl ether N.D. ppb 10. 071300000N Vinyl chloride N.D. 1. 071400000N ppb Chloroethane N.D. 1. 071500000N ppb Methylene chloride N.D. 1. 071600000N ppb 1,1-Dichloroethene N.D. ppb 1. 071700000N 1,1-Dichloroethane N.D. ppb 1. 071800000N trans-1,2-Dichloroethene N.D. 1. ppb 071900000N Chloroform N.D. ppb 1. 072000000N 1.2-Dichloroethane N.D. 1. 072100000N ppb 1,1,1-Trichloroethane N.D. dqq 1. 072200000N Carbon tetrachloride 1. N.D. 072300000N ppb Dichlorobromomethane 1. N.D. 072400000N ppb 1,2-Dichloropropane N.D. ppb 1. 072500000N trans-1,3-Dichloropropene N.D. ppb 1. 072600000N Trichloroethene N.D. ppb 1. 072700000N Dibromochloromethane N.D. 1. 072800000N ppb 1,1,2-Trichloroethane N.D. 1. 072900000N ppb cis-1,3-Dichloropropene N.D. ppb 1. 073000000N Bromoform N.D. ppb 2. 073100000N 1,1,2,2-Tetrachloroethane N.D. ppb 2. 073200000N Tetrachloroethene N.D. 073300000N ppb

2000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 -

RESULT

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye



mber American Council of ependent Laboratories, Inc.

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

000110



2425 NEW HOLLAND PIKE, LANCASTER, PA 17601

Environ: Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally 86-2 Grab Water Sample Collected 5/13/86 (1115) by FDS & TDM

Date Reported 6/3/86

Date Submitted 5/14/86

Discard Date 6/11/86

Collected by C

P.O. BALLY

Rel.

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEI	VED	DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	. bbp	1.	071600000N
1,1-Dichloroethene	N.D.	ppb	1.	071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2-Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	N.D.	ppb	1.	072200000N
Carbon tetrachloride	N.D.	ppb	1.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	N.D.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	1.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	1.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	N.D.	ppb	1.	073300000N

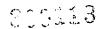
2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye



SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis





Environ Resources Management 999 West Chester Pike

P. O. Box 357

West Chester, PA 19380

Bally Eng. Structures MW86-3S 4" PVC Well Grab

Collected on 05/12/86 (1330) by FDS & TDM

Date Reported 5/13/86 Date Submitted Discard Date 6/12/86 Collected by C P.O. Rel.

		RESULT		LIMIT OF	
	Volatiles in Groundwater	AS RECEIVE	:D	DETECTION	LAB CODE
	Benzene	N.D.	ppb	1.	070300000N
	Toluene	N.D.	ppb	1.	070400000N
	Chlorobenzene	N.D.	ppb	1.	070500000N
	Ethylbenzene	N.D.	ppb	1.	070600000N
	Chloromethane	N.D.	ppb	5.	071100000N
	Bromomethane	N.D.	ppb	5.	071200000N
	2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
	Vinyl chloride	N.D.	ppb	1.	071400000N
	Chloroethane	. N.D.	ppb	1.	071500000N
	Methylene chloride	N.D.	ppb	1.	071600000N
	1,1-Dichloroethene	170.	ppb	1.	071700000N
	1,1-Dichloroethane	8.	ppb	1.	071800000N
	trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
	Chloroform	N.D.	ppb	1.	072000000N
	1,2-Dichloroethane	N.D.	ppb	1.	072100000N
	1,1,1-Trichloroethane	1,300.	ppb	1.	072200000N
,	Carbon tetrachloride	N.D.	ppb	25.)72300000N
	Dichlorobromomethane	N.D.	ppb	1.	072400000N
	1,2-Dichloropropane	N.D.	ppb	1.	072500000N
	trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
	Trichloroethene	4.	ppb	1.	072700000N
	Dibromochloromethane	N.D.	ppb	1.	072800000N
	1,1,2-Trichloroethane	N.D.	ppb	1.	072900000N
	cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
	Bromoform	N.D.	ppb	2.	073100000N
	1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
	Tetrachloroethene	N.D.	ppb	1.	073300000N

The normal reporting limit for carbon tetrachloride was not attained due to the high level of 1,1,1-trichloroethane.

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for aboratory Accreditation Chemical & Biological fields of testing

mber American Council of rependent Laboratories, Inc.

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis



Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380

Bally Eng. Structures MW86-3D 6" Steel Well Grab

Collected on 05/12/86 (1420) by FDS & TDM

6/*4/86 Date Reported Date Submitted 5/13/86 Discard Date 6/12/86 Collected by C P.O. Rel.

Thirty-Sample:NovaWW. 10694

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEI	AS RECEIVED		LAB CODE
Benzene	N.D.	ppb	10.	070300000N
Toluene	N.D.	ppb	10.	070400000N
Chlorobenzene	N.D.	ppb	10.	070500000N
Ethylbenzene	N.D.	ppb	10.	070600000N
Chloromethane	N.D.	ppb	50.	071100000N
Bromomethane	N.D.	ppb	50.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	100.	071300000N
Vinyl chloride	N.D.	ppb	10.	071400000N
Chloroethane	N.D.	ppb	10.	071500000N
Methylene chloride	N.D.	ppb	10.	071600000N
1,1-Dichloroethene	130.	ppb	10.	071700000N
1,1-Dichloroethane	240.	ppb	10.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	10.	071900000N
Chloroform	N.D.	ppb	10.	072000000N
1,2-Dichloroethane	N.D.	ppb	10.	072100000N
1,1,1-Trichloroethane	210.	ppb	10.	072200000N
Carbon tetrachloride	N.D.	ppb	10.	072300000N
Dichlorobromomethane	N.D.	ppb	10.	072400000N
1,2-Dichloropropane	N.D.	ppb	10.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	10.	072600000N
Trichloroethene	90.	ppb	10.	072700000N
Dibromochloromethane	N.D.	ppb	10.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	10.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	10.	073000000N
Bromoform	N.D.	ppb	20.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	20.	073200000N
Tetrachloroethene	N.D.	ppb	10.	073300000N

Normal reporting limits were not attained due to dilution of the sample made necessary by the high level of some compounds.

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for aboratory Accreditation

Chemical & Biological fields of testing

mber American Council of ependent Laboratories, Inc SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis



2425 NEW HOLLAND PIKE, LANCASTER, PA 17601

LLI Sample No. WW 51069690

Environ. Resources Management
999 West Chester Pike
P. O. Box 357
West Chester, PA 19380
Bally 86-4 Grab Water Sample
Collected 5/13/86 (1015) by FDS & TDM

Date Reported 6/3/86
Date Submitted 5/14/86
Discard Date 6/11/86
Collected by C
P.O. BALLY

Rel.

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEI	VED	DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	500.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1-Dichloroethene	570.	ppb	1.	071700000N
1,1-Dichloroethane	7.	ppb	1.	071800000N
trans-1,2-Dichloroethene	11.	ppb	1.	071900000N
Chloroform	7.	ppb	1.	072000000N
1,2-Dichloroethane	2.	ppb	1.	072100000N
1,1,1-Trichloroethane	2,300.	ppb	1.	072200000N
Carbon tetrachloride	N.D.	ppb	30.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	- 1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	4,300.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	350.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	350.	072900000N
cis·1,3·Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	125.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	47.	ppb	1.	073300000N

Normal reporting limits were not attained for some compounds due to the high levels of 1,1,1-trichloroethane and trichloroethene.

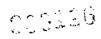
2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

imber American Council of tependent Laboratories, Inc. SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis





2425 NEW HOLLAND PIKE, LANCASTER, PA

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380

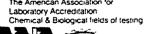
Bally Eng. Structures MW86-5S 6" Steel Well Grab

Collected on 05/12/86 (1400) by FDS & TDM

Date Reported 6/-4/86 Date Submitted 5/13/86 Discard Date 6/12/86 Collected by C P.O. Rel.

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEIVED		DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1-Dichloroethene	N.D.	ppb	1.	071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2-Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	3.	ppb	1.	072200000N
Carbon tetrachloride	N.D.	ppb	1.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	N.D.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	1.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	1.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	N.D.	ppb	1.	073300000N

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

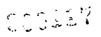




SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis





2425 NEW HOLLAND PIKE LANCASTER PA 1760

Environ. Resources Management 999 West Chester Pike P. O. Box 357

West Chester, PA 19380

Bally Eng. Structures MW86-5D 6" Steel Well Grab Collected on 05/12/86 (1455) by FDS & TDM

Date Reported & 6/4/86

Date Submitted 5/13/86

Discard Date 6/12/86

Collected by C

P.O.

Rel.

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEI	CVED	DETECTION	LAB CODE
Benzene	N.D.	ppb	2.	070300000N
Toluene	N.D.	ppb	2.	070400000N
Chlorobenzene	N.D.	ppb	2.	070500000N
Ethylbenzene	N.D.	ppb	2.	070600000N
Chloromethane	N.D.	ppb	10.	071100000N
Bromomethane	N.D.	ppb	10.	071200000N
<pre>2-Chloroethylvinyl ether</pre>	N.D.	ppb	20.	071300000N
Vinyl chloride	N.D.	ppb	2.	071400000N
Chloroethane	N.D.	ppb	2.	071500000N
Methylene chloride	N.D.	ppb	2.	071600000N
1,1-Dichloroethene	4.	ppb	2.	071700000N
1,1-Dichloroethane	N.D.	ppb	2.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	2.	071900000N
Chloroform	N.D.	ppb	2.	072000000N
1,2-Dichloroethane	N.D.	ppb	2.	072100000N
1,1,1-Trichloroethane	31.	ppb	2.	072200000N
Carbon tetrachloride	N.D.	ppb	2.	072300000N
Dichlorobromomethane	N.D.	ppb	2.	072400000N
1,2-Dichloropropane	N.D.	ppb	2.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	2.	072600000N
Trichloroethene	110.	ppb	2.	072700000N
Dibromochloromethane	N.D.	ppb	2.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	2.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	2.	073000000N
Bromoform	N.D.	ppb	4.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	4.	073200000N
Tetrachloroethene	N.D.	ppb	2.	073300000N

Normal reporting limits were not attained due to dilution of the sample made necessary by the high level of trichloroethene.

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

The American Association for Laboratory Accreditation Chemical & Biological fields of testing



SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

0000118



INCORPORATED 2425 NEW HOLLAND PIKE, LANCASTER, PA 1760

学、学生。1717;656-2301-13

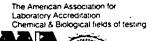
JAAR Sample No. VV 1069692

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Plant Well Grab Water Sample Collected 5/13/86 (1230) by FDS & TDM Date Reported 6/ 3/86
Date Submitted 5/14/86
Discard Date 6/11/86
Collected by C
P.O. BALLY
Rel.

	RESULT	•	LIMIT OF	
Volatiles in Groundwater	AS RECEIVED		DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1.Dichloroethene	10.	ppb	1.	071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	12.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2-Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	11.	ppb	1.	072200000N
Carbon tetrachloride	N.D.	ppb	1.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	170.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	5.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	5.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	37.	ppb	1.	073300000N

Normal reporting limits were not attained for some compounds due to the made necessary by the high level of trichloroethene.

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye



nber American Council of opendent Laboratories, Inc.

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis





2425 NEW HOLLAND PIKE LANCASTER PA 1760

Unit Sample: No. VW 1069693

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Farm Products Grab Water Sample Collected 5/13/86 (1344) by FDS & TDM Date Reported 6/ 3/86
Date Submitted 5/14/86
Discard Date 6/11/86
Collected by C
P.O. BALLY
Rel.

		RESULT		LIMIT OF	
	Volatiles in Groundwater	AS RECEIV	/ED	DETECTION	LAB CODE
	Benzene	N.D.	ppb	1.	070300000N
	Toluene	N.D.	ppb	1.	070400000N
	Chlorobenzene	N.D.	ppb	1.	070500000N
	Ethylbenzene	N.D.	ppb	1.	070600000N
	Chloromethane	N.D.	ppb	5.	071100000N
	Bromomethane	N.D.	ppb	5.	071200000N
	2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
	Vinyl chloride	N.D.	ppb	1.	071400000N
	Chloroethane	N.D.	ppb	1.	071500000N
	Methylene chloride	N.D.	ppb	1.	071600000N
	1,1-Dichloroethene	N.D.	ppb	1.	071700000N
	1,1-Dichloroethane	N.D.	ppb	1.	071800000N
	trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
	Chloroform	N.D.	ppb	1.	072000000N
	1,2-Dichloroethane	N.D.	ppb	1.	072100000N
	1,1,1-Trichloroethane	N.D.	ppb	1.	072200000N
•	Carbon tetrachloride	N.D.	ppb	1.	072300000N
	Dichlorobromomethane	N.D.	ppb	1.	072400000N
	1,2-Dichloropropane	N.D.	ppb	1.	072500000N
	trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
	Trichloroethene	N.D.	ppb	1.	072700000N
	Dibromochloromethane	N.D.	ppb	1.	072800000N
	1,1,2-Trichloroethane	N.D.	ppb	1.	072900000N
	cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
	Bromoform	N.D.	ppb	2.	073100000N
	1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
	Tetrachloroethene	N.D.	ppb	1.	073300000ท

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation Chemical & Biological fields of testing



SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

000120



425 NEW HOLLAND PIKE, LANCASTER, PA 17601

(LIAT ASample No. WW 1069694)

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Gramer Knitting Grab Water Sample Collected 5/13/86 (1415) by FDS & TDM Date Reported 6/ 3/86
Date Submitted 5/14/86
Discard Date 6/11/86
Collected by C
P.O. BALLY
Rel.

		RESULT		LIMIT OF	
	Volatiles in Groundwater	iwater AS RECEIVED		DETECTION	LAB CODE
	Benzene	N.D.	ppb	1.	070300000N
	Toluene	N.D.	ppb	1.	070400000
	Chlorobenzene	N.D.	ppb	1.	070500000
	Ethylbenzene	N.D.	ppb	1.	070600000
	Chloromethane	N.D.	ppb	5.	071100000
	Bromomethane	N.D.	ppb	5.	071200000
	2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000
	Vinyl chloride	N.D.	ppb	1.	071400000
	Chloroethane	N.D.	ppb	1.	071500000
	Methylene chloride	N.D.	ppb	1.	071600000
	1,1-Dichloroethene	3.	ppb	1.	071700000
	1,1-Dichloroethane	N.D.	ppb	1.	071800000
	trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000
	Chloroform	N.D.	ppb	1.	072000000
	1,2-Dichloroethane	N.D.	ppb	1.	072100000
1	1,1,1-Trichloroethane	26.	I-bp	1.	072200000
	Carbon tetrachloride	N.D.	ppb	1.	072300000
	Dichlorobromomethane	N.D.	ppb	1.	072400000
	1,2-Dichloropropane	N.D.	ppb	1.	072500000
	trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000
	Trichloroethene	14.	ppb	1.	072700000
	Dibromochloromethane	N.D.	ppb	1.	072800000
	1,1,2-Trichloroethane	N.D.	ppb	1.	072900000
	cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000
	Bromoform	N.D.	ppb	2.	073100000
	1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000
	Tetrachloroethene	N.D.	ppb	1.	073300000

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye



SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis





1000 INCORPORATED 425 NEW HOLLAND PIKE, LANCASTER, PA 17601

indi sample vice vije 1069695

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Ribbon Mill Grab Water Sample Collected 5/13/86 (1440) by FDS & TDM Date Reported 6/ 3/86
Date Submitted 5/14/86
Discard Date 6/11/86
Collected by C
P.O. BALLY
Rel.

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEIVED		DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1.Dichloroethene	2.	ppb	1.	071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2-Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	27.	ppb	1.	072200000N
Carbon tetrachloride	N.D.	ppb	1.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	4.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	1.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	1.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	6.	ppb	1.	073300000N

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

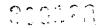
The American Association for Laboratory Accreditation Chemical & Biological fields of testing



SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis





125 NEW HOLLAND PIKE, LANCASTER, PA 17601

LIME Sample No VV 1069696

Environ. Resources Management 999 West Chester Pike P. 0. Box 357 West Chester, PA 19380 Bally Gene Smith Grab Water Sample Collected 5/13/86 (1455) by FDS & TDM Date Reported
Date Submitted
Discard Date
Collected by C
P.O. BALLY
Rel.

6/ 3/86
5/14/86
6/11/86

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEIVED		DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1-Dichloroethene	N.D.	ppb	1.	071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2-Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	N.D.	ppb	1.	0722/00000N
Carbon tetrachloride	N.D.	ppb	1.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	N.D.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	1.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	1.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	N.D.	ppb	1.	073300000N

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye



ber American Council of

≥pendent Laboratories, Inc.

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

THBULS AND ABBREVIATIONS



2425 NEW HOLLAND PIKE, LANCASTER, PA 17601

Link Sample Nor (Wr 106969)

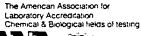
Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Keh's Brothers Grab Water Sample Collected 5/13/86 (1505) by FDS & TDM Date Reported 6/ 3/86
Date Submitted 5/14/86
Discard Date 6/11/86
Collected by C
P.O. BALLY
Rel.

TTMTT OF

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEIVED		DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1-Dichloroethene	N.D.	ppb	1.	071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2-Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	N.D.	ppb	1.	072200000N
Carbon tetrachloride	N.D.	ppb	1.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	N.D.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	1.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	1.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	N.D.	ppb	1.	073300000N
			· ·	

DECLIFE

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye





SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

000111



2425 NEW HOLLAND PIKE LANCASTER PA 17601

HARE Sample No. AVE 1069698

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Charles Conrad Grab Water Sample Collected 5/13/86 (1520) by FDS & TDM Date Reported 6/ 3/86
Date Submitted 5/14/86
Discard Date 6/11/86
Collected by C
P.O. BALLY
Rel.

THE AR

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEIVED		DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1-Dichloroethene	N.D.	ppb	1.	071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2.Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	N.D.	ppb	1.	072200000N
Carbon tetrachloride	N.D.	ppb	1.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	N.D.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	1.	072800000N
1,1,2.Trichloroethane	N.D.	ppb	1.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	N.D.	ppb	1.	073300000N

ספכווו יי

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye



er American Council of

pendent Laboratories, Inc.

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis





2425 NEW HOLLAND PIKE, LANCASTER, PA 17601

4969699 Tri (1069699)

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Leo Baurer Grab Water Sample Collected 5/13/86 (1530) by FDS & TDM Date Reported 6/ 3/86
Date Submitted 5/14/86
Discard Date 6/11/86
Collected by C
P.O. BALLY
Rel.

TTUTE OF

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEI	VED	DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
<pre>2-Chloroethylvinyl ether</pre>	N.D.	ppb	10.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1-Dichloroethene	N.D.	ppb	1.	071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2-Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	N.D.	ppb	1.	07220000JN
Carbon tetrachloride	N.D.	ppb	1.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	N.D.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	1.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	1.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	N.D.	ppb	1.	073300000N

DDCIII M

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye



SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

200126

4 17 1 W



5 NEW HOLLAND PIKE, LANCASTER, PA 17601

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Bally Moser Well Grab Water Sample Collected 5/13/86 (1545) by FDS & TDM

Date Reported 6/3/86
Date Submitted 5/14/86
Discard Date 6/11/86
Collected by C
P.O. BALLY
Rel.

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECE	IVED	DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1-Dichloroethene	N.D.	ppb	1.	071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2-Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	N.D.	ppb	1.	072200000N
Carbon tetrachloride	N.D.	ppb	1.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	N.D.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	1.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	1.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	N.D.	ppb	1.	073300000N

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

Chemical & Biological fields of te

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

200127



LLISSamplexNorwPVz1069963

ં છેક્ટર્લા જે કો717) 656**-2301 કે**ક્ટર Environ. Resources Management 999 West Chester Pike.

P. O. Box 357

West Chester, PA Gehman Well Tap Water Sample

Collected on 05/14/86 at 0955 by FDS & TDM

Date Reported 6/ 3/86 Date Submitted 5/15/86 Discard Date 6/11/86 Collected by FDS P.O. 43102

Rel.

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEIVED		DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	.1.	070500000ท
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1-Dichloroethene	34.	ppb	1.	071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2-Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	160.	ppb	1.	072200000N
Carbon tetrachloride	N.D.	ppb	5.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	110.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	1.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	1.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	N.D.	ppb	1.	073300000N

The normal reporting limit for carbon tetrachloride was not attained due to the high level of 1,1,1-trichloroethane.

Lancaster Laboratories is certified by Pennsylvania Department of Environmental Resources (#36-037) for water testing.

N.D. means None Detected

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Chemical & Biological fields of testing

> SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C: Entz, B.A. Group Leader, Organic Analysis

ber American Council of rendent Laboratories, Inc.



2425 NEW HOLLAND PIKE, LANCASTER, PA 1760

2.11th Sample von 221 106996

Environ. Resources Management 999 West Chester Pike P. O. Box 357 West Chester, PA 19380 Longacre Dairy Well Grab Tap Water Sample Collected on 05/14/86 at 1010 by FDS & TDM Date Reported 6/3/86
Date Submitted 5/15/86
Discard Date 6/11/86
Collected by FDS
P.O. 43102

Rel.

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEIVED		DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000ท
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1-Dichloroethene	N.D.	ppb	1.	071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2-Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	N.D.	ppb	1.	072200000N
Carbon tetrachloride	N.L.	ppb	1.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	N.D.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	1.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	1.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	N.D.	ppb	1.	073300000N

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

tendent Laboratories, Inc.

SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

000129



2425 NEW HOLLAND PIKE, LANCASTER, PA 17601

Environ. Resources Management
999 West Chester Pike
P. O. Box 357
West Chester, PA 19380
Nace Well Grab Tap Water Sample
Collected on 05/14/86 at 1035 by FDS & TDM

Date Reported 6/3/86
Date Submitted 5/15/86
Discard Date 6/11/86
Collected by FDS
P.O. 43102
Rel.

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECE	IVED	DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
<pre>2-Chloroethylvinyl ether</pre>	N.D.	ppb	10.	071300000ท
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1-Dichloroethene	N.D.	ppb	1.	-071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2-Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	N.D.	ppb	1.	072200000N
Carbon tetrachloride	N.D.	ppb	1.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	N.D.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	1.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	1.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	N.D.	ppb	1.	073300000N

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation Chemical & Biological fields of testing



SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A.
Group Leader, Organic Analysis

203480



ega, 1966–1964 – Francisco III (1966–230) (1968–1964) Environ. Resources Management 999 West Chester Pike

P. O. Box 357

West Chester, PA 19380 Bally Municipal #1 Grab Tap Water Sample

Collected on 05/14/86 at 0940 by FDS & TDM

Date Reported 6/ 3/86 Date Submitted 5/15/86 Discard Date 6/11/86 Collected by FDS P.O. 43102 Rel.

TTVTM AD

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEI	AS RECEIVED		LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	.ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
2-Chloroethylvinyl ether	N.D.	ppb	10.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1-Dichloroethene	5.	ppb	1.	071700000N
1,1-Dichloroethane	N.D.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	N.D.	ppb	1.	072000000N
1,2-Dichloroethane	N.D.	ppb	1.	072100000N
1,1,1-Trichloroethane	46.	ppb	1.	072200000N
Carbon tetrachloride	N.D.	ppb	1.	072300000N
Dichlorobromomethane	N.D.	ppb	1.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	10.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	1.	072800000N
1,1,2.Trichloroethane	N.D.	ppb	1.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	ppb	2.	073200000N
Tetrachloroethene	N.D.	ppb	1.	073300000N

D D C I I I M

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation ical & Biological fields of testing

> SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted Lancaster Laboratories, Inc. Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

200101 AR300131

per American Council of endent Laboratories, Inc.



2425 NEW HOLLAND PIKE LANCASTER PA 1760

Environ. Resources Management
999 West Chester Pike
P. O. Box 357
West Chester, PA 19380
Bally Municipal #3 Grab Tap Water Sample
Collected on 05/14/86 at 0920 by FDS & TDM

Date Reported 6/3/86
Date Submitted 5/15/86
Discard Date 6/11/86
Collected by FDS
P.O. 43102
Rel.

	RESULT		LIMIT OF	
Volatiles in Groundwater	AS RECEIVED		DETECTION	LAB CODE
Benzene	N.D.	ppb	1.	070300000N
Toluene	N.D.	ppb	1.	070400000N
Chlorobenzene	N.D.	ppb	1.	070500000N
Ethylbenzene	N.D.	ppb	1.	070600000N
Chloromethane	N.D.	ppb	5.	071100000N
Bromomethane	N.D.	ppb	5.	071200000N
<pre>2-Chloroethylvinyl ether</pre>	N.D.	ppb	50.	071300000N
Vinyl chloride	N.D.	ppb	1.	071400000N
Chloroethane	N.D.	ppb	1.	071500000N
Methylene chloride	N.D.	ppb	1.	071600000N
1,1-Dichloroethene	360.	ppb	1.	071700000N
1,1-Dichloroethane	4.	ppb	1.	071800000N
trans-1,2-Dichloroethene	N.D.	ppb	1.	071900000N
Chloroform	1.	ppb	1.	072000000N
1,2-Dichloroethane	1.	ppb	1.	072100000N
1,1,1-Trichloroethane	2,500.	ppb	1.	072200000r
Carbon tetrachloride	N.D.	ppb	75.	072300000N
Dichlorobromomethane	N.D.	ppb	20.	072400000N
1,2-Dichloropropane	N.D.	ppb	1.	072500000N
trans-1,3-Dichloropropene	N.D.	ppb	1.	072600000N
Trichloroethene	640.	ppb	1.	072700000N
Dibromochloromethane	N.D.	ppb	25.	072800000N
1,1,2-Trichloroethane	N.D.	ppb	25.	072900000N
cis-1,3-Dichloropropene	N.D.	ppb	1.	073000000N
Bromoform	N.D.	ppb	2.	073100000N
1,1,2,2-Tetrachloroethane	N.D.	. bbp	2.	073200000N
Tetrachloroethene	3.	ppb	1.	073300000N

Normal reporting limits were not attained for some compounds due to the high levels of 1,1,1-trichloroethane and trichloroethene.

Lancaster Laboratories is certified by Pennsylvania Department of Environmental Resources (#36-037) for water testing.

N.D. means None Detected

2 COPIES TO Environmental Resources Mgmt. ATTN: David R. Blye

The American Association for Laboratory Accreditation Chemical & Biological fields of testing

ner American Council of indent Laboratories, Inc. SEE REVERSE SIDE FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS

Respectfully Submitted
Lancaster Laboratories, Inc.
Reviewed and Approved by:

Richard C. Entz, B.A. Group Leader, Organic Analysis

200122

Chain Of Custody Record



Environmental Resources Management, inc. 999 West Chester Pike • P.O. Box 357 • West Chester, Pennsylvania 19381 & (215) 696-9110

Project No. / Sampler(s)_ Date Sample	1.D. <u>43102</u> FD: 2d_5=1_4	2 10 5 M	Vly C.	ing Struct † 86	<i>tunus</i> _sh Bc	neet No ottles Supottle Bate	pplied By	love b.	a b
Sample I.D.	Sample Description		ample Type	Sampling Method	Time	No. Of Contain- ers	A Re	Analysis equested	Remarks
TB4 4.7	SOIL	64	2AB	Spain	10:00	1	VO) A	
TB-3 8.0'	17		, ,	,,	10,30	IJ	11		
TB-1 101	1)	11		//	15.00	JI	, ,		
78-1 15'	17		,,	01	11	1	12		
TB-1 261	٠,٦	, 1			11]/	/1		
	1								
Relinquisl	shed By (Stanature)		Re	eceived By (Signature	i)	Dat	te/Time	Reason	For Transfer
Deth Yr	romarch		W	Hoch	uan	4/14	1868735	Bottle 1.	SUD
mode	B		15.	Barry				Botto de	mp of L
S. Pou	my		11	11.500		5/2/	186 1200	Bottle tra	notes
10 such Mhulemen 3/686/350 Somple transfer					transter.				

Copies: White - Sampler; Yellow - Lab; Pink - Client; Gold - File

AR300 133.

Chain Of Custody Record



Environmental Resources Management, Inc.

999 West Chester Pike • P.O. Box 357 • West Chester, Pennsylvania 19381 🕿 (215) 696-9110

Project No. / I.D. 43/00 Bally Cry Structures Sheet No. Sampler(s) F. D. 8m M. T. D. M. CHMEL Bottles Supplied By Lanc Labor										
Sampler(s)_	Sampler(s) F. D. 8MITH, T. D. MICHMEL Bottles Supplied By Lane Labs									
Date Sample	ed <u>5'-</u>	12-86				ch No				
Sample 1.D.	Sample Description	Sample Type	Sampling Method	Time	No. Of Contain- ers		Analysis equested	Remarks		
86-1	4"PVC WELL	GRAB	BAIL	12:30	3	VOLAT GROUN	DWATER			
86-35	<i>))</i>	J1	11	13:30	3	<i>1</i> /				
56-31)	6"SIEGL	ابر	<i>J</i>)	17:20	3	ч				
86-55	1)	۱))) ·	14:00	3					
86-51)	6"TEEL WELL	H	//	14:55	3					
					·					
					·		·			
Relinquished By (Signature) Received By (Signature) Date/Time Reason For Transfer										
Suth M	march	OK	16.0	414186 175 Bottle Bres						
Weblackenson S. Bourses 1 1 /14/8/2 1200 Bottle drop of										
S. Po	any		Ind	5/12/86 Pioc Bottle transfor						
How Mohn lanes						5/13/86 135 Sample Hanste				
·	7				/ -7		ı - 			

Copies: White - Sampler, Yellow - Lab; Pink - Client; Gold - File

000184



Project No. / I.D. Dally Sheet No									
Sample 1.D.	Sample Description	Sample Type	Sampling Method				Remarks		
86-4	PYCLL	GRAB	BAIL	10:15	3	VOLATILES GROUNTER			
86-2	PYC PYC Z''	1,	1,	11:15	3	,			
PLANT WELL	STEEL WELL	11	11	12:30	2	1)			
FARM PRODUCTS	HOME).1	11	13:44	2	1)			
CR AMER KNITTING	PROO WELL) 1	12	14:15	Z	11			
BALLY RIBSON MILI	1)	, `	11	14:40	2	١.,١		<u>.</u>	
MILI GENE SMITH	HOME WELL) (17	14:55	2	ζ (
KEH IS BROTHERS	BUS WELL	1,	/1	15:05	Z	}1			
CONBAD	MERC	11	7.1	15.20	2	//			
LEO BAURER	HOUSE	"	/3	15:30	2	///			
Relinquished By (Signature) Received By (Signature)						Date/Time Reason For Transfer			
Linds down Mille					5-1-	1:31)	MHI	DALA O	
Wet	fording,	A Eli	Tho	\$	5-13-86 800 500				
M	TAK	7 16	Hallen	rock.	5/14/86 1015 Sample Tran			Trans,	

Copies: White - Sampler; Yellow - Lab; Pink - Client; Gold - File

Chain Of Custody Record

Project No. / I.D. 43/02 Sally Cray Survey Sheet No. 2 of 2 Sampler(s) F. Q. Sm ITH T. D. MICHALL Bottles Supplied By Local Sampled 5-13-86 Bottle Batch No										
Sampler(s)_	F.O. Sm	ITH	UT.	D. MICHA	EL Bo	ottles Su	pplied By	lanc La	57	
Date Sample	Date Sampled 5-13-86 Bottle Batch No.									
Sample I.D.	Sample Description		mple ype	Sampling Method	Time	No. Of Analysis Contain- Requested ers			Remarks	
MOSER WELL	MOSER FARM GI			TAP	15:45	Z	VOLA GROSA	TILES DOWATER		
	·									
					-					
Relinquist	hed By (Signature)		Re	Received By (Signature)			te/Time	Reason	r For Transfer	
Both 47	nonarch		William !			414/86 875 Battle Pu		P		
J. Hackman			1 <u>s.</u> c	arry	//		85 130	Bottle '	drop of	
S. Pa	my	4	4	Hall	7	5-13-0	BC 8:00	Posttle to	rayister	
4111	21/1	}	W.b.	Inlama		5/4/1	16 1045	Singl	transter	



999 West Chester Pike • West Chester, Pennsylvania 19382 🕿 (215) 696-9110

F	Project No. / I.D. 43102 Pally In Services Sampler(s) F. D. Smith T. D. MICHAEL Bottles Supplied By Live Lab 5 Date Sampled 5-14-86 Bottle Batch No.										
	Sample I.D.	Sample Description		ample Type	Sampling Method	Time	No. Of Contain- ers		nalysis equested	Remarks	
l	BALLY MUNKIPAL # 3	Public surply WELL	GK	RAB	TAP	9:20	2	8	LES IN DWATER		
1	BALLY MUNKIPAL 11 # 1			i t	1)	9:40	11				
	BEHMAN WELL	WELL	,,	ı	11	9:55	h	1,			
	LONGACKE DAIRY WELL	ACKE BUS.		"	()	10:10	11	1)			
	NACE WELL	1			g :	10:35	11	, 1			
1				٠.							
-	Received By (Signature) Received By (Signature) Alth Monarca S. Courry S. Courry							Date/Time Reaso		For Transfer	
ľ								414186 A7 35 Lottle Prep		ep	
k								4/14/80 DOU B		Bottle drop of	
1	S. Bury 8/1/2001						5-13-	8C P:00	Bottle +	ransfer	
ď	Marth Metalburan							1861200	Janual	2 trans	
1										,	

Copies: White - Sampler; Yellow - Lab; Pink - Client; Gold - File

Appendix C

Quality Assurance Program

100158

The ERM Group

Quality Assurance Program

The objective of the quality assurance program for the Phase II investigation at the Bally facility was to ensure that the data collected and produced through field and laboratory analyses was representative, comparable, and complete. This objective was met in the following manner:

- Representativeness -- Use of U.S. EPA-recommended procedures for the obtainment, preservation, preparation, handling, and storage of all samples.
- Comparability -- The use of consistent procedures, reporting units, standardized methods of analysis, and standardized data format.
- <u>Completeness</u> -- Obtaining all data as outlined in the scope of work.

Field data collection was performed by a qualified ERM hydrogeologist who logged each well and monitored each well installation for consistency with the well specifications discussed in Section 2.1 The log of each monitoring well borehole along with the as-built well details is presented in Appendix A of this report. The locations and the tops of all monitoring well casings were surveyed by a licensed surveyor. The surveyed point on the casing was marked for use in water level measurements.

Soil samples were collected by split spoon sampling per ASTM method D1586-67 (see Section 2.2). Ground water samples were collected using procedures described in Section 2.3 including initial water level measurement, evacuation of three volumes

0.0359

The ERM Group

water prior to sampling, use of dedicated bailers for each well, use of 40ml glass vials with teflon septum lids, and storage at 4°C until delivery to the laboratory for analysis.

Decontamination was performed on all well casings and screens prior to installation, drilling equipment between borings or wells, and on all sampling equipment (split spoons, submersible pump for well purging, dedicated bailers) between samples.

Appropriate EPA chain-of-custody procedures were utilized during sample handling. Chain-of-custody records for the soil and ground water samples collected and analyzed during the Phase II investigation are presented in Appendix B. Laboratory analyses were performed by Lancaster Laboratories of Lancaster, Pennsylvania, a PA DER certified (#36-037) laboratory. Soil samples were analyzed for purgeable aromatics (EPA method 602) and purgeable hydrocarbons (EPA method 601). Ground (ater samples were analyzed for EPA priority pollutant volatile organics (EPA method 624). The laboratory work-up sheets for all analyses are presented in Appendix B.